Appendix H:

Climate Action Plan

February 2012

The Fullerton Plan
Climate Action Plan

2030

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LIST OF ACRONYMS

AB	Assembly Bill
APS	Alternate Plan Strategy
ARTIC	Anaheim Regional Transportation Intermodal Center
BAU	business as usual
BRT	bus rapid transit
BTA	Bicycle Transportation Account
BTP	Bicycle Transportation Plan
CACP	Clean Air Climate Protection
CAFE	corporate average fleet fuel economy
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAP	Center for Clean Air Policy
CCAR	California Climate Action Registry
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH_4	Methane
CIWMB	California Integrated Waste Management Board
CO_2	Carbon Monoxide
CPUC	California Public Utilities Commission
CSU	California State University
CWIB	California Workforce Investment Board
EIR	Environmental Impact Report
EMFAC2007	California Air Resource Board Emission Factors Model
EO	Executive Order
EPA	Environmental Protection Agency
FCAA	Federal Clean Air Act
FEMA	Federal Emergency Management Agency
GCJC	Green Collar Jobs Council
GHG	Greenhouse Gas
GVW	gross vehicle weight

GWP	Global Warming Potential
H_2O	Water Vapor
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
ICLEI	International Council for Local Environmental Initiatives
IPCC	International Panel on Climate Change
LCFS	Low Carbon Fuel Standard
LEED	Leadership in Energy and Environmental Design
LVW	loaded vehicle weight
MMT	million metric tons
MPOs	Metropolitan Planning Organizations
MPG	miles per gallon
MRF	Material Recovery Facility
MSEP	Metrolink Service Expansion Program
MSL	mean seal level
MT	metric tons
$MTCO_2eq$	metric tons of carbon dioxide equivalents
MWD	Metropolitan Water District
MWDOC	Municipal Water District of Orange County
N_2O	Nitrous Oxide
NF_3	nitrogen trifluoride
O_3	Ozone
OAL	Office of Administrative Law
OCCOG	Orange County Council of Governments
OC SCS	Orange County Sustainable Communities Strategy
OCTA	Orange County Transportation Authority
OCWD	Orange County Water District
OPR	Office of Planning and Research
PFCs	Perfluorocarbons
PPM	parts per million
PPT	parts per trillion
RPS	Renewable Portfolio Standard
SB	Senate Bill
SCAG	Southern California Association of Governments

SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SF_6	Sulfur hexafluoride
SCS	Sustainable Communities Strategy
Tg	Teragram
UNFCCC	United Nations Framework Convention on Climate Change
VHFHSZ	Very High Fire Hazard Severity Zones
VMT	vehicle miles traveled
VTI	Victoria Transport Institute

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Chapter 1.0

Introduction

CHAPTER 1.0
INTRODUCTION

PURPOSE OF THE CLIMATE ACTION PLAN

In order to address the global climate change, the City has prepared a Climate Action Plan (CAP), which provides a framework for reducing greenhouse gas (GHG) emissions. The CAP recommends GHG emissions targets that are consistent with the reduction targets of the State of California and presents a number of strategies that would make it possible for the City to meet the recommended targets. The CAP also suggests best practices for implementation and makes recommendations for measuring progress.

The CAP is intended to address the main sources of the emissions that cause climate change, which include emissions from the energy consumed in buildings and for transportation, as well as the solid waste sent to landfills. The purpose of the CAP is to guide the development, enhancement, and ultimately the implementation of actions that will reduce the City's GHG emissions by 15 percent below existing levels. The CAP has been designed to support the following functions:

- Describe Fullerton's emissions sources;
- Provide projections of future emissions based on growth;
- Provide clear guidance to City staff regarding when and how to implement key provisions of the plan;
- Recommend strategies, measures, and actions to achieve GHG reductions;
- Demonstrate Fullerton's commitment to comply with State GHG reduction efforts; and
- Define a strategy for turning this plan into action and transparently tracking and reporting progress toward the GHG reduction goals.

RELATIONSHIP TO THE FULLERTON PLAN

The CAP implements policies that have been identified in the Built Environment and Natural Environment Master Elements, including the Mobility, Bicycle, Water, Air Quality and Climate Change, and Integrated Waste Management Chapters of The Fullerton Plan. The Fullerton Plan includes specific goals and policies that guide the City's approach to climate change, including guidelines for preparing inventories or plans and general reduction strategies. As climate change is a cross-cutting issue addressed by many elements of The Fullerton Plan, the CAP as a whole is considered an implementation measure for the relevant policies discussed in The Fullerton Plan. This structure allows the City to update the CAP on an on-going, as-needed basis to ensure that the City's climate protection efforts reflect both current legislation and emerging best practices.

RELATIONSHIP TO CALIFORNIA ENVIRONMENTAL QUALITY ACT

The City's approach to addressing GHG emission reductions within The Fullerton Plan is parallel to the climate change planning process being followed by more than 50 California jurisdictions. This process includes:

- Completing a baseline GHG emissions inventory and projecting future emissions;
- Identifying a community-wide GHG reduction target;
- Preparing a CAP to identify strategies and measures to meet the reduction target;
- Identifying targets and reduction strategies in The Fullerton Plan and evaluating the environmental impacts of the CAP in The Fullerton Plan Environmental Impact Report (EIR);
- Monitoring effectiveness of reduction measures and adapting the plan to changing conditions; and
- Adopting the CAP in a public process following environmental review.

This approach is consistent with the California Environmental Quality Act (CEQA) Guidelines Section 15183.5(a), which states that lead agencies may adopt a plan for the reduction of GHG emissions that can then be used for project-specific environmental documents to tier from and/or incorporate by reference that existing programmatic review pursuant to CEQA Guidelines Sections 15183.5(b), 15064(h)(3), and 15130.

One of the primary uses for a CAP is to establish significance thresholds for reviewing projects under CEQA. CEQA requires the City to identify the significant environmental impacts of its discretionary actions and to avoid or mitigate those impacts if feasible. The *CEQA Guidelines*, as updated pursuant to Senate Bill (SB) 97, acknowledges that climate change is an environmental issue that requires analysis under CEQA and encourages the use of a plan consistency threshold for cumulative impacts on climate change. Projects that demonstrate consistency with the strategies, actions, and emission reduction targets contained in the CAP would have a less than significant impact on climate change.

When the City undertakes a discretionary action, such as approval of a proposed development project, plan, policy, or code change, the City will evaluate whether that action would result in a significant climate change impact.

Adoption of the CAP itself by the City is considered a project under CEQA. The overall purpose of the CAP is to reduce the impact that the community will have on global climate change to reduce the impact on the environment. However, implementation of the CAP could potentially result in adverse impacts on the physical environment, such as degrading visual resources, biological resources, or cultural resources. The potential impacts of the CAP are being evaluated as part of the EIR for The Fullerton Plan. With completion and adoption of The Fullerton Plan EIR, the CAP will have undergone environmental review under CEQA. The CAP

is intended to reduce the City's impact on climate change; therefore, determining the consistency of a proposed project with the CAP is one way to evaluate whether a project would have a significant climate change impact.

When determining whether a proposed project is consistent with the CAP, the following should be considered:

- ***Step 1:*** Consider the consistency of the discretionary project (magnitude and location of growth) with The Fullerton Plan's year 2030 growth projections, which are the basis of the GHG emissions inventory projects. If the project is consistent with The Fullerton Plan projections, the project is consistent with the CAP.

If the discretionary project is not consistent with The Fullerton Plan's year 2030 growth projections, the project is not necessarily inconsistent with the CAP. The following steps must be performed to determine consistency:

- ***Step 2:*** Consider the extent to which the project supports or includes applicable strategies and measures, or advances the action identified in the CAP.

- ***Step 3:*** Consider the consistency of the project with the emission reduction targets set by the CAP.

- ***Step 4:*** Consider the extent to which the project would not interfere with the implementation of CAP strategies, objectives, measures or actions.

A project that can justify its consistency with Steps 2, 3 and or 4 can be deemed consistent with the CAP by the Community Development Director.

The emission reduction targets are a critical factor in determining CAP consistency. Therefore, the CAP target must be set at a level that demonstrates consistency with State targets, but should be feasible for the vast majority of projects to achieve. If the reduction target percentage is set at a level that is infeasible, EIRs could be required for a large number of projects. A statement of overriding considerations would possibly be required and no additional emission reductions would be achieved if feasible emission reductions were not available.

If the City determines in its environmental review that the proposed project would conflict with the CAP, the City would be required to incorporated mitigation measures, where feasible, within the proposed project to minimize its GHG emissions and/or climate change impact. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant unavoidable impact and the City has the option to adopt a statement of overriding considerations as described in Section 15093 of the State *CEQA Guidelines*.

PUBLIC PARTICIPATION

City of Fullerton residents and business leaders participated in the formulation of the CAP through participation in The Fullerton Plan community visioning workshops as well as through the General Plan Advisory Committee (GPAC) meetings. The Fullerton Plan is being completed simultaneously with this CAP. Community members have provided valuable input that has been used to select GHG reduction measures.

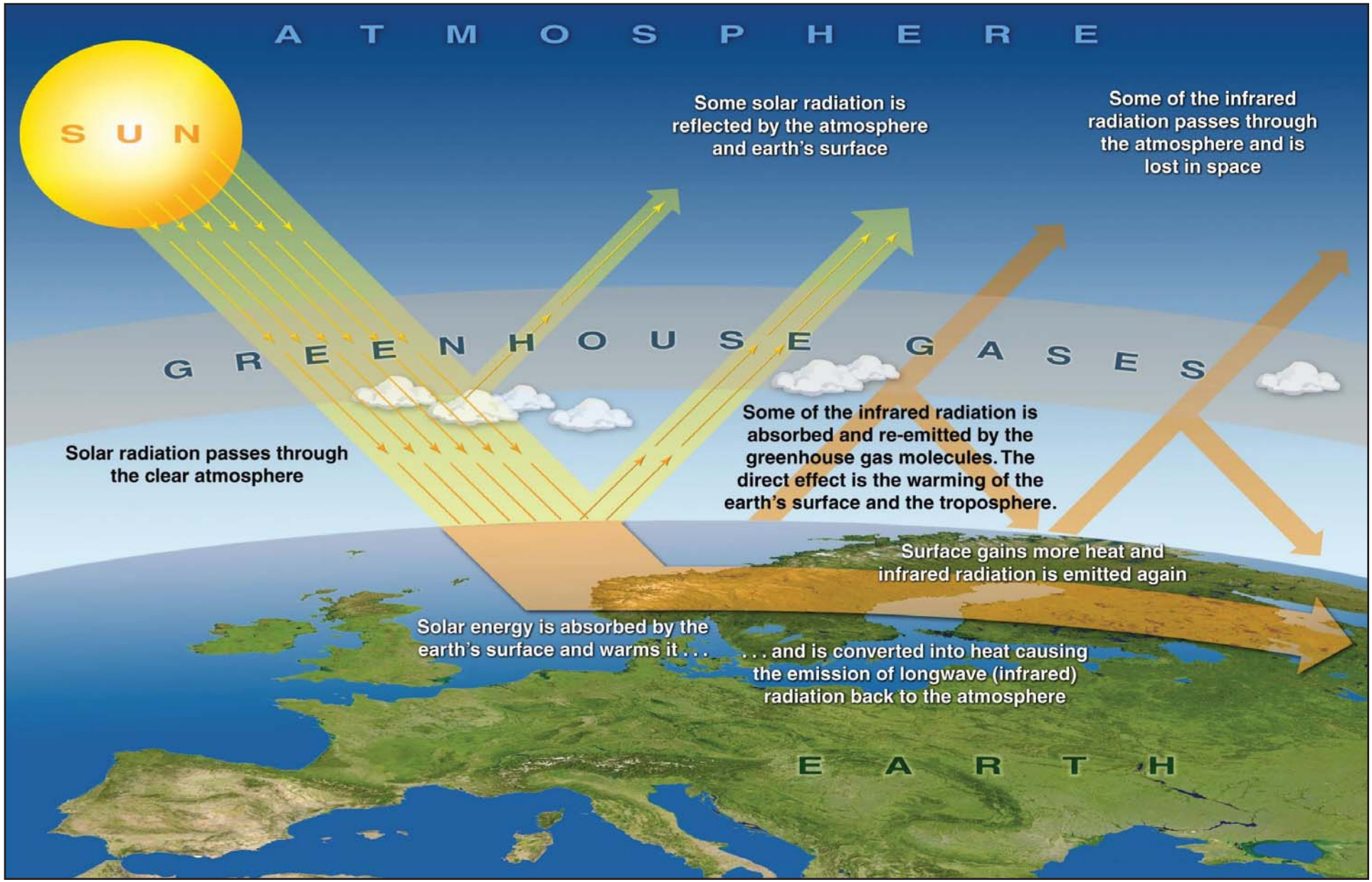
A variety of outreach tools allowed residents who wished to participate to do so in a manner with which they felt comfortable. Outreach efforts included "focused future" visioning charrettes (six meetings), youth visioning workshops (4 meetings), visioning open house, and an ongoing online survey. The Fullerton Plan updates were shared with the public through roadshow presentations (presentations to Chamber of Commerce, the Fullerton Collaborative, the Transportation and Circulation Commission, the Parks and Recreation Commission, and the Rotary Club), the virtual Fullerton Community Open House, and The Fullerton Plan Educational Program Series (2 meetings). The community workshops included presentations, surveys, group activities, and comments. Information about The Fullerton Plan was available on the City's website to provide the public with information on past and upcoming events, as well as links to documents and reports. The information gathered from these meetings and surveys were used to formulate The Fullerton Plan goals and policies upon which the GHG reduction strategies, objectives, measures, and actions are derived for this CAP.

GREENHOUSE EFFECT AND GREENHOUSE GASES

The natural process through which heat is retained in the troposphere is called the "greenhouse effect."[1] The greenhouse effect traps heat in the troposphere through a three-fold process, summarized as follows: short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and GHGs in the upper atmosphere absorb this long wave radiation and emit this long wave radiation into space and toward the Earth. This "trapping" of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect. This process is illustrated in Exhibit 1, *The Greenhouse Effect*.

The most abundant GHGs are water vapor and carbon dioxide. Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential for each GHG based on its ability to absorb and re-radiate long wave radiation. The Global Warming Potential of a gas is determined using carbon dioxide as the reference gas with a Global Warming Potential of one (1).

[1] The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.


ATMOSPHERE
SUN
Some solar radiation is reflected by the atmosphere and earth's surface
Some of the infrared radiation passes through the atmosphere and is lost in space
GREENHOUSE GASES
Some of the infrared radiation is absorbed and re-emitted by the greenhouse gas molecules. The direct effect is the warming of the earth's surface and the troposphere.
Solar radiation passes through the clear atmosphere
Surface gains more heat and infrared radiation is emitted again
Solar energy is absorbed by the earth's surface and warms it . . .
. . . and is converted into heat causing the emission of longwave (infrared) radiation back to the atmosphere
EARTH

NOT TO SCALE

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FULLERTON CLIMATE ACTION PLAN

The Greenhouse Effect

Exhibit 1

GHGs normally associated with a proposed project include the following:[2]

- ***Water Vapor (H_2O).*** Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively. The primary human related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IPCC) has not determined a GWP for water vapor.

- ***Carbon Dioxide (CO2).*** CO_2 is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, the concentration of CO_2 in the atmosphere has increased 36 percent.[3] CO_2 is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.

- ***Methane (CH4).*** CH_4 is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of CH_4 are landfills, natural gas systems, and enteric fermentation (the digestive process in animals with a rumen, typically cattle, causing methane gas). CH_4 is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of CH_4 is 21.

- ***Nitrous Oxide (N_2O).*** N_2O is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production (for the industrial production of nylon), and nitric acid production (for rocket fuel, woodworking, and as a chemical reagent). The GWP of N_2O is 310.

- ***Hydrofluorocarbons (HFCs).*** HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 140 for HFC-152a to 11,700 for HFC-23.[4]

- ***Perfluorocarbons (PFCs).*** PFCs are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semi conductor manufacturing. PFCs are potent GHGs with a GWP several thousand times that of CO_2, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).[5] The GWP of PFCs range from 6,500 to 9,200.

[2] All Global Warming Potentials are given as 100 year GWP. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change. Climate Change (Intergovernmental Panel on Climate Change, *Climate Change, The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC*, 1996).

[3] U.S. Environmental Protection Agency, *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2008*, April 2010.

[4] U.S. Environmental Protection Agency, *High GWP Gases and Climate Change*, June 22, 2010.

- ***Sulfur hexafluoride (SF6).*** SF_6 is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. SF_6 is the most potent GHG that has been evaluated by the Intergovernmental Panel on Climate Change with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [PPT] in 1990 versus 365 parts per million [PPM], respectively).[6]

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric O_3 depletors; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

- ***Hydrochlorofluorocarbons (HCFCs).*** HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The GWPs of HCFCs range from 93 for HCFC-123 to 2,000 for HCFC-142b.[7]

- ***1,1,1 trichloroethane.*** 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The GWP of methyl chloroform is 110 times that of CO_2.[8]

- ***Chlorofluorocarbons (CFCs).*** CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the U.S. Environmental Protection Agency's (EPA) Final Rule (57 FR 3374) for the phase out of O_3 depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with GWPs ranging from 4,600 for CFC 11 to 14,000 for CFC 13.[9]

GLOBAL GHG EMISSIONS

Atmospheric data for GHG concentrations over the past 800,000 years demonstrates that concentrations of CO_2 (which comprises the majority of GHG emissions) have increased since pre-industrial times. Concentrations have increased from approximately 280 parts per million (PPM) to approximately 353 PPM in 1990, and to approximately 379 PPM in 2005.

[5] Ibid.

[6] Ibid.

[7] U.S. Environmental Protection Agency, *Protection of Stratospheric Ozone: Listing of Global Warming Potential for Ozone Depleting Substances*, October 29, 2009.

[8] Ibid.

[9] U.S. Environmental Protection Agency, *Class I Ozone Depleting Substances*, August 19, 2010.

In 2000, the IPCC outlined potential global emission scenarios for the coming century. The scenarios vary from a best case scenario with a low population growth, clean technologies, and low GHG emissions, to a worst case scenario of a high population growth and fossil fuel dependence resulting in extreme levels of GHG emissions. While some degree of climate change is inevitable, most climate scientists agree that in order to avoid excessive climate change, atmospheric GHG concentrations should be stabilized at 350 to 400 PPM.

NATIONWIDE GHG EMISSIONS

Based on data produced by the EPA's *2010 Inventory of U.S. Greenhouse Gas Emissions and Sinks*, GHG emissions in the United States were 6,956.8 teragrams (Tg) CO_2eq[10] in 2008.[11] As indicated by the EPA, total nationwide emissions have risen by approximately 14 percent from 1990 to 2008. Emissions declined from 2007 to 2008, decreasing by 2.9 percent (211.3 Tg CO_2eq.). This decrease is primarily a result of a decrease in demand for transportation fuels associated with the record high costs of these fuels that occurred in 2008. Additionally, electricity demand declined in 2008 in part due to a significant increase in the cost of fuels used to generate electricity. In 2008, temperatures were cooler in the United States than in 2007, both in the summer and the winter. This lead to an increase in heating related energy demand in the winter, but much of this increase was offset by a decrease in cooling related electricity demand in the summer. Overall, from 1990 to 2008 total GHG emissions increased by 820.4 Tg CO_2eq (16.1 percent), while CH_4 and N_2O emissions decreased by 45.8 Tg CO_2eq (7.5 percent) and 4.1 Tg CO_2eq (1.3 percent), respectively.

STATEWIDE GHG EMISSIONS

In May 2010, the California Air Resources Board (CARB) prepared a GHG inventory that compiles statewide anthropogenic GHG emissions and sinks. It includes estimates for CO_2, CH_4, N_2O, SF_6, nitrogen trifluoride (NF_3), HFCs, and PFCs for the years 2000 through 2008. According to the CARB GHG emission inventory estimates, California emitted approximately 478 million metric tons (MMT) of CO_2eq emissions in 2008.[12] California's total GHG emissions are larger than every other state with the exception of Texas. However, California has a relatively low carbon emission intensity. In 2001, California ranked the fourth lowest per-capita CO_2 emissions from fossil fuel combustion in the country, due to the success of its energy efficiency and renewable energy programs. California's energy programs and policies have had multiple benefits that include not only reducing GHG emissions, but reducing energy demand and improving air quality and public health.[13] If emissions continue to increase at business as usual (BAU)[14] rates, statewide emissions are expected to increase to approximately 600 metric

[10] Carbon Dioxide Equivalent (CO_2eq) - A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

[11] U.S. Environmental Protection Agency, *2010 Inventory of U.S. Greenhouse Gas Emissions and Sinks*, 2010.

[12] California Air Resources Board, *Greenhouse Gas Inventory Data - 2000 to 2008*, May 28, 2010.

[13] California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 - Final Staff Report, publication # CEC-600-2006-013-SF*, December 22, 2006, and updated January 23, 2007.

[14] "Business as Usual" refers to emissions that would be expected to occur in the absence of GHG reductions. See http://www.arb.ca.gov/cc/inventory/data/forecast.htm, accessed on April 20, 2011. Note that there is significant controversy as to what BAU means. In determining the GHG 2020 limit, CARB used the above as the "definition." It is broad enough to allow for design features to be counted as reductions.

tons (MT) CO_2eq by 2020, which represents a 40 percent increase above 1990 levels. In order for the State to participate in global efforts to avoid dangerous climate change, California's GHG emissions need to be reduced to at least 1990 levels by 2020[15] and 80 percent below 1990 levels by 2050.[16]

GLOBAL EFFECTS OF CLIMATE CHANGE

The primary effect of global climate change has been a rise in average global tropospheric temperature of 0.2 degrees Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005.[17] Climate change modeling using year 2000 emission rates shows that further warming would occur, which would include further changes in the global climate system during the current century.[18] Changes to the global climate system and ecosystems and to California would include, but would not be limited to:

- The loss of sea ice and mountain snow pack resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;[19]
- Rise in global average sea level primarily due to thermal expansion and melting of glaciers and ice caps and the Greenland and Antarctic ice sheets;[20]
- Changes in weather that include widespread changes in precipitation, ocean salinity, and wind patterns, and more energetic extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;[21]
- Decline of the Sierra snow pack (which accounts for approximately half of the surface water storage in California) by 70 percent to as much as 90 percent over the next 100 years;[22]
- Increase in the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas of Los Angeles and the San Joaquin Valley by the end of the 21st century;[23] and

[15] California Air Resources Board, *Climate Change Scoping Plan,* 2008,.

[16] Ibid.

[17] Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, 2007.

[18] Ibid.

[19] Ibid.

[20] Ibid.

[21] Ibid.

[22] California Environmental Protection Agency, *Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature (Executive Summary)*, March 2006.

[23] Ibid.

- High potential for erosion of California's coastlines and sea water intrusion into the Delta and levee systems due to the rise in sea level.[24]

While there is broad agreement on the causative role of GHGs to climate change, there is considerably less information or consensus on how climate change would affect any particular location, operation, or activity. The IPCC has published numerous reports on potential impacts of climate change on the human environment. These reports provide a comprehensive and up-to-date assessment of the current state of knowledge on climate change. The IPCC notes the fact that there is little consensus as to the ultimate impact of human interference with the climate system and its causal connection to global warming trends; however, current evidence indicates that human interference in the climate system exacerbates natural climate change.

LOCAL EFFECTS OF CLIMATE CHANGE

The following climate change effects could affect the City of Fullerton. However, the type and degree of the impacts that climate change would have on humans and the environment is difficult to predict at the local scale.

- ***Sea Level Rise.*** According to the IPCC, climate change is expected to raise sea levels by up to four feet. The City of Fullerton is approximately 11 miles from the Pacific Ocean and has a mean elevation of 150 feet above mean sea level (MSL). Sea levels are anticipated to rise 12 to 18 inches by 2050.[25] Therefore, sea level rise of this magnitude would be unlikely to inundate the City. Additionally, the effects related to sea level rise are speculative at this time. However, if determined to be a significant threat, protective measures such as levees would likely be installed by regional and local governments to protect urbanized areas.

- ***Water Supply.*** The City receives some of its water supplies from the State Water Project through the Metropolitan Water District of Southern California (MWD). Surface water supplies in the City from the State Water Project could potentially be reduced as a result of climate change effects.[26] Climate change could also impact groundwater supplies. Warmer temperatures could lead to higher evaporation or shorter rainfall seasons. Higher evapotranspiration would likely reduce the amount of water available for recharge and can lead to greater pumping of groundwater to make up for losses in surface water.[27] Groundwater serves as a source of water supply in Fullerton from wells in the Orange County Groundwater Basin, which could result in serious implications for water supply in the City.

- ***Natural Disasters.*** Climate change could result in increased flooding and weather-related disasters. The City is located approximately 11 miles from the Pacific Ocean and could be exposed to intense coastal storms. The frequency of large floods on rivers and streams could also increase. Portions of the City near creeks and streams are located

[24] Ibid.

[25] California Natural Resources Agency, *2009 California Climate Adaptation Strategy*, December 2009.

[26] California Department of Water Resources, *Progress on Incorporating Climate Change into Management of California's Water Resources*, July 2006.

[27] California Natural Resources Agency, *2009 California Climate Adaptation Strategy*, December 2009.

within FEMA 100-year flood zone areas as well as small scattered areas in the south part of the City.

- ***Wildfires.*** Climate change could result in increased occurrences and duration of wildfire events due to warmer temperatures, longer dry seasons, reduced winter precipitation, and early snowmelt. Fullerton experiences long periods of hot-dry weather and high velocity desert winds. The City is not located within areas designated by the California Department of Forestry and Fire Protection (CalFire) as Very High Fire Hazard Severity Zones (VHFHSZ). While not considered to have significant areas subject to wildland fire hazard, the City does have large, undeveloped oil lands that are generally covered with grass and light brush; however, fire brakes and the weed abatement ordinance are maintained.

- ***Public Health.*** Climate change could cause an increase in infections, disease, asthma, and other health-related problems.[28] Heat waves are expected to have a major impact on public health as well as decreasing air quality and an increase in mosquito breeding and mosquito-borne diseases. Vector control districts throughout the State are already evaluating how they will address the expected changes to California's climate.[29]

- ***Air Quality.*** Climate change would compound negative air quality impacts in the South Coast Air Basin, resulting in respiratory health impacts.[30] Prepared by the California Natural Resources agency, the *2009 California Climate Adaptation Strategy* states that climate change influences on atmospheric processes will promote formation of ground-level pollutants, such as ozone and secondary aerosols (particulate matter), and that these increases could offset much of the potential gains achieved through air pollution control measures. However, this would be a regional effect.

Other predicted physical and environmental impacts associated with climate change include biome shifts, impacts on agriculture and the food supply, and strain on the existing capacity of sanitation and water-treatment facilities. While these issues are a concern for society at large, none of these impacts would have a disproportionate effect on the City of Fullerton. However, Chapter 3, *Climate Action Strategies*, identifies actions and strategies aimed at reducing the effects of climate change on the City.

LEGISLATION AND REGULATORY CONTEXT

Federal

The Federal government is extensively engaged in international climate change activities in areas such as science, mitigation, and environmental monitoring. The EPA actively participates in multilateral and bilateral activities by establishing partnerships and providing leadership and technical expertise. Multilaterally, the United States is a strong supporter of activities under the United Nations Framework Convention on Climate Change (UNFCCC) and the IPCC.

[28] California Climate Change Center, *Our Changing Climate, Assessing the Risks to California,* July 2006.

[29] California Natural Resources Agency. *2009 California Climate Adaptation Strategy*, December 2009.

[30] California Environmental Protection Agency, *AB 1493 Briefing Package*, 2008.

In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical, and socioeconomic information relevant to understanding the scientific basis of human-induced climate change, its potential impacts, and options for adaptation and mitigation. The most recent reports of the IPCC have emphasized the scientific consensus around the evidence that real and measurable changes to the climate are occurring, that they are caused by human activity, and that significant adverse impacts on the environment, the economy, and human health and welfare are unavoidable.

The Federal Clean Air Act (FCAA) requires the EPA to define national ambient air quality standards (national standards) to protect public health and welfare in the United States. The FCAA does not specifically regulate GHG emissions; however, on April 2, 2007 the U.S. Supreme Court in *Massachusetts v. U.S. Environmental Protection Agency*, determined that GHGs are pollutants that can be regulated under the FCAA. The EPA adopted an endangerment finding and cause of contribute finding for GHGs on December 7, 2009. The final findings were published in the Federal Register on December 15, 2009 under Docket ID No. EPA-HQ-OAR-2009-0171. The final rule was effective January 14, 2010.

Under the endangerment finding, the Administrator found that the current and projected atmospheric concentrations of the six, key, well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) threaten the public health and welfare of current and future generations. Under the cause of contribute finding, the Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

Based on these findings, on April 1, 2010, the EPA finalized the light-duty vehicle rule controlling GHG emissions. This rule confirmed that January 2, 2011, is the earliest date that a 2012 model year vehicle meeting these rule requirements may be sold in the United States. On May 13, 2010, the EPA issued the final GHG Tailoring Rule. This rule set thresholds for GHG emissions that define when permits under the Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. Currently, EPA rules do not cover residential construction projects. Implementation of the Federal rules is expected to reduce the level of emissions from new motor vehicles and large stationary sources. The EPA annually publishes the *Inventory of U.S. Greenhouse Gas Emissions and Sinks* for estimating sources of GHGs that is generally consistent with the IPCC methodology developed in its *Guidelines for National Greenhouse Gas Inventories*.

In December 2007, Congress passed the first increase in corporate average fleet fuel economy (CAFE) standards. The new CAFE standards represent an increase to 35 miles per gallon (MPG) by 2020. In March 2009, the Obama Administration announced that for the 2011 model year, the standard for cars and light trucks will be 27.3 MPG, the standard for cars will be 30.2 MPG; and standard for trucks would be 24.1 MPG. Additionally, in May 2009 President Barack Obama announced plans for a national fuel-economy and GHG emissions standard that would significantly increase mileage requirements for cars and trucks by 2016. The new requirements represent an average standard of 39 MPG for cars and 30 MPG for trucks by 2016. In July 2011, President Obama announced the next phase to increase fuel efficiency. These new standards cover cars and light trucks for model years 2017 through 2025, requiring performance equivalent to 54.5 MPG in 2025, while reducing GHG emissions to 163 grams per mile.

In September 2009, the EPA finalized a GHG reporting and monitoring system that began on January 1, 2010. In general, this national reporting requirement will provide the EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons (MT) or more of CO_2 per year.[31] This publicly available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost-effective emissions reduction strategies. This new program covers approximately 85 percent of the nation's GHG emissions and applies to approximately 10,000 facilities. The reporting system is intended to provide a better understanding of where GHGs are coming from and will guide development of the best possible policies and programs to reduce emissions.

State of California

Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is occurring, and that there is a real potential for severe adverse environmental, social, and economic effects in the long term. Every nation emits GHGs and as a result makes an incremental cumulative contribution to global climate change; therefore, global cooperation will be required to reduce the rate of GHG emissions enough to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

There are currently no state regulations in California that establish ambient air quality standards for GHGs. However, California has passed laws directing CARB to develop actions to reduce GHG emissions, and several state legislative actions related to climate change and GHG emissions have come into play in the past decade.

ASSEMBLY BILL 1493

In response to the transportation sector accounting for more than half of California's CO_2 emissions, Assembly Bill (AB) 1493 (AB 1493, Pavley) was enacted on July 22, 2002. AB 1493 required CARB to set greenhouse gas emission standards for passenger vehicles, light duty trucks, and other vehicles whose primary use is noncommercial personal transportation in the State. The bill required that CARB set the greenhouse gas emission standards for motor vehicles manufactured in 2009 and all subsequent model years. In setting these standards, CARB must consider cost effectiveness, technological feasibility, economic impacts, and provide maximum flexibility to manufacturers. CARB adopted the standards in September 2004. (See Title 13, Cal. Code of Regs., § 1900, 1961.)

Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1) require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily for the transportation of persons), beginning with the 2009 model year. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for the 2016 model year are approximately 37 percent lower than the limits for the first year of the

[31] The majority of individual sources within the City would not emit more than 25,000 MT of CO_2 per year. Facilities that produce more than 25,000 MT of CO_2 per year include refineries, power plants, or cement production facilities, or other large scale processing/production facilities.

regulations, the 2009 model year. For light-duty trucks with LVW of 3,751 pounds to gross vehicle weight (GVW) of 8,500 pounds, as well as medium-duty passenger vehicles, GHG emissions would be reduced approximately 24 percent between 2009 and 2016. These standards are intended to reduce emissions of carbon dioxide and other greenhouse gases (i.e., nitrous oxide and methane). Some currently used technologies that achieve greenhouse gas reductions include small engines with superchargers, continuously variable transmissions, and hybrid electric drive.

In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against CARB to prevent enforcement of 13 CCR Sections 1900 and 1961 as amended by AB 1493 and 13 CCR 1961.1 (*Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon, in Her Official Capacity as Executive Director of the California Air Resources Board, et al*.). The automobile-makers' suit in the U.S. District Court for the Eastern District of California, contended California's implementation of regulations that, in effect, regulate vehicle fuel economy, violates various Federal laws, regulations, and policies.

On December 12, 2007, the court found that if California receives appropriate authorization from the EPA (the last remaining factor in enforcing the standard), then these regulations would be consistent with and have the force of Federal law, thus, rejecting the automobile-makers' claim. This authorization to implement more stringent standards in California was requested in the form of a FCAA Section 209(b), waiver in 2005. Since that time, the EPA failed to act on granting California authorization to implement the standards. Former Governor Schwarzenegger and former Attorney General Edmund G. Brown filed suit against EPA for the delay. In December 2007, former EPA Administrator Stephen Johnson denied California's request for the waiver to implement AB 1493. Johnson cited the need for a national approach to reducing GHG emissions, the lack of a "need to meet compelling and extraordinary conditions," and the emissions reductions that would be achieved through the Energy Independence and Security Act of 2007 as the reasoning for the denial.

The State of California filed suit against the EPA for its decision to deny the FCAA waiver. The change in the presidential administration resulted in the EPA reexamining its position for denial of California's FCAA waiver and for its past opposition to GHG emissions regulation. California received the waiver on June 30, 2009.

EXECUTIVE ORDER S-20-04

Executive Order S-20-04, the California Green Building Initiative, (signed into law on December 14, 2004), establishes a goal of reducing energy use in state-owned buildings by 20 percent from a 2003 baseline by 2015. It also encourages the private commercial sector to set the same goal.

The initiative places the California Energy Commission in charge of developing a building efficiency benchmarking system, commissioning and retro-commissioning (commissioning for existing commercial buildings) guidelines, and developing and refining building energy efficiency standards under Title 24 to meet this goal.[32]

[32] California Energy Commission, *Green Building Initiative, State of California Executive Order S-20-04,* http://www.energy.ca.gov/greenbuilding/, accessed on April 20, 2011.

EXECUTIVE ORDER S-3-05

In June 2005, California's GHG emissions reduction targets were established in Executive Order S-3-05. The Executive Order established the following goals:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions 80 percent below 1990 levels.

The Secretary of the California Environmental Protection Agency (the Secretary) is required to coordinate efforts of various agencies in order to collectively and efficiently reduce greenhouse gases. Some of the agencies involved in the greenhouse gas reduction plan include Secretary of Business, Transportation, and Housing Agency, Secretary of Department of Food and Agriculture, Secretary of Resources Agency, Chairperson of CARB, Chairperson of the Energy Commission, and the President of the Public Utilities Commission. The Secretary is required to submit a biannual progress report to the Governor and State Legislature disclosing the progress made toward greenhouse gas emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California's water supply, public health, agriculture, and the coastline and forestry, and reporting possible mitigation and adaptation plans to combat these impacts.

ASSEMBLY BILL 32 (CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006)

The Legislature enacted AB 32 (AB 32, Nuñez), the California Global Warming Solutions Act of 2006, which was signed on September 27, 2006 to further the goals of Executive Order S-3-05. (Health & Safety Code, § 38500 et seq.) AB 32 requires CARB to adopt statewide greenhouse gas emissions limits to achieve statewide GHG emissions levels realized in 1990 by 2020. A longer-range goal requires an 80 percent reduction in GHG emissions from 1990 levels by 2050. CARB adopted the 2020 statewide target and mandatory reporting requirements in December 2007, and a statewide scoping plan in December 2008 (the AB 32 Scoping Plan). AB 32 represents the first enforceable statewide program to limit greenhouse gas emissions from all major industries, with penalties for noncompliance. CARB has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. The foremost objective of CARB is to adopt regulations that require the reporting and verification of statewide greenhouse gas emissions. This program would be used to monitor and enforce compliance with the established standards. In passing the bill, the California Legislature found that:

> *Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems [California Health & Safety Code, Sec. 38500, Division 25.5, Part 1].*

CARB is required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions. AB 32 allows CARB to adopt market-based compliance mechanisms to meet the specified requirements. In December 2008,

CARB adopted a Scoping Plan to achieve reductions in greenhouse gas emissions in California. The plan indicates how reductions in significant greenhouse gas sources would be achieved through regulations, market mechanisms, and other actions.

On December 16, 2010, CARB endorsed the long-awaited regulation implementing California's GHG cap-and-trade program. Pursuant to AB 32, and subject to a variety of final actions by the Executive Director and approval by the Office of Administrative Law (OAL), the regulations will be included within Title 17 of the California Code of Regulation, sections 95800-96022, entitled "California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms."

The cap-and-trade program covers approximately 80 percent of the State's total GHG emissions and is considered a key element in achieving the overall strategy set forth in the Scoping Plan. The program, as implemented through the regulation, "caps" GHG emissions by issuing annual allowances (each covering the equivalent of one metric ton of carbon dioxide equivalent [$MTCO_2eq$]) to regulated entities. Covered entities include those that meet the inclusion threshold of 25,000 $MTCO_2eq$ per year and engage in: cement production; cogeneration; glass production; hydrogen production; iron and steel production; lime manufacturing; nitric acid production; oil and natural gas systems; petroleum refining; paper and pulp manufacturing; electricity generating facilities (including operators located in California or electricity importers); and natural gas suppliers.

The regulation also allows entities that engage in the above production and manufacturing activities to opt-in even if they do not meet the 25,000 metric ton inclusion threshold. Others may also voluntarily associate into the program. By opening the program to non-covered entities, CARB hopes to create a trading market in which investment banks, citizens groups and the general public would be allowed to hold allowances and would be subject to the registration and reporting requirements. The first compliance phase begins on January 1, 2012 through December 31, 2014, and will cover all major industrial sources, including the electricity industry and large industrial plants that manufacture glass, paper, concrete and other products. The second compliance phase begins on January 1, 2015 through December 31, 2017, and will cover distributors of transportation fuels, natural gas and other fuels. A third compliance period starts on January 1, 2018 through December 31, 2020.

As noted above, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted. In order to advise the Board, CARB staff convened an Environmental Justice Advisory Committee and an Economic and Technology Advancement Advisory Committee.

SENATE BILL 1368

SB 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed into law in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007. SB 1368 also required California Energy Commission (CEC) to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas–fired plant. Furthermore, the legislation states that all electricity provided to California, including imported electricity, must be generated by plants that meet the standards set by CPUC and CEC.

EXECUTIVE ORDER S-1-07

On January 18, 2007, California further solidified its dedication to reducing greenhouse gases by setting a new Low Carbon Fuel Standard for transportation fuels sold within the State. Executive Order S-1-07 sets a declining standard for greenhouse gas emissions measured in carbon dioxide equivalent gram per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least ten percent by 2020. The Low Carbon Fuel Standard applies to refiners, blenders, producers, and importers of transportation fuels and would use market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods. The Executive Order requires the Secretary of the California Environmental Protection Agency to coordinate with actions of the California Energy Commission, CARB, the University of California, and other agencies to develop a protocol to measure the "life cycle carbon intensity" of transportation fuels.

SENATE BILL 97

SB 97, signed in August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the Governor's Office of Planning and Research (OPR), which is part of the state Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions (or the effects of GHG emissions), as required by CEQA, by July 1, 2009. SB 97 also removes, both retroactively and prospectively, the legitimacy of litigation alleging inadequate CEQA analysis of effects of GHG emissions in the environmental review of projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006 or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1B or 1E). This provision was repealed by operation of law on January 1, 2010. Therefore, any projects that remain unapproved are no longer be protected against litigation claims of failure to adequately address climate change issues. In the future, this bill will only protect a handful of public agencies from CEQA challenges on certain types of projects, and only for a few years time.

As set forth more fully below, in June 2008, OPR published a technical advisory recommending that CEQA lead agencies make a good-faith effort to estimate the quantity of GHG emissions that would be generated by a proposed project. Specifically, based on available information, CEQA lead agencies should estimate the emissions associated with project-related vehicular traffic, energy consumption, water usage, and construction activities to determine whether project-level or cumulative impacts could occur, and should mitigate the impacts where feasible.[33] OPR requested CARB technical staff to recommend a method for setting CEQA thresholds of significance as described in Section 15064.7 of the *CEQA Guidelines* that will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state.

On December 30, 2009, the Natural Resources Agency adopted the *CEQA Guidelines Amendments* prepared by OPR, as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the *CEQA Guidelines Amendments*, and filed them with the

[33] Governor's Office of Planning and Research, *CEQA AND CLIMATE CHANGE: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*, June 19, 2008.

Secretary of State for inclusion in the California Code of Regulations. The *CEQA Guidelines Amendments* became effective on March 18, 2010.

SENATE BILLS 1078, 107, 107, X1-2, EXECUTIVE ORDER S-14-08, AND S-21-09

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, Executive Order S-14-08 was signed, which expands the state's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, Executive Order S-21-09 (signed on September 15, 2009) directs CARB to adopt regulations requiring 33 percent of electricity sold in the state come from renewable energy by 2020. CARB adopted the "Renewable Electricity Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers. On April 12, 2011, Governor Jerry Brown reinforced the requirements of Executive Order S-21-09, and signed SB X1-2 requiring California's electric utilities to procure 33 percent of their energy from renewable resources by 2020.

SENATE BILL 375

SB 375 requires metropolitan planning organizations (MPOs) to include sustainable communities strategies in their regional transportation plans. The purpose of SB 375 is to reduce greenhouse gas emissions from automobiles and light trucks, require CARB to provide greenhouse gas emission reduction targets from the automobile and light truck sector for 2020 and 2035 by January 1, 2010, and update the regional targets until 2050. SB 375 requires certain transportation planning and programming activities to be consistent with the sustainable communities strategies contained in the regional transportation plan. The bill also requires affected regional agencies to prepare an alternative planning strategy to the sustainable communities strategies if the sustainable communities strategy is unable to achieve the greenhouse gas emissions reduction targets. Former Governor Schwarzenegger signed and approved SB 375 on September 30, 2008.

SB 375 includes the ability to streamline certain projects which are consistent with an MPO's Sustainable Communities Strategy (see *CEQA Guidelines*, § 15183.5, subd. [c]). CARB released its staff report on proposed regional GHG reduction targets for passenger cars and light trucks as well as its CEQA Functional Equivalent Document on August 9, 2010.

ASSEMBLY BILL 3018

AB 3018, the California Green Collar Jobs Act of 2008, was signed into law on September 26, 2008. AB 3018 established the Green Collar Jobs Council (GCJC) under the California Workforce Investment Board (CWIB). The GCJC will develop a comprehensive approach to address California's emerging workforce needs associated with the emerging green economy. This bill will ignite the development of job training programs in the clean and green technology sectors.[34]

[34] California Workforce Investment Board, http://www.cwib.ca.gov/sc_green_collar_jobs_council.htm, accessed on April 20, 2011.

EXECUTIVE ORDER S-13-08

Executive Order S-13-08, seeks to enhance the state's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of State's first climate adaptation strategy. This will result in consistent guidance from experts on how to address climate change impacts in the State of California.[35]

ASSEMBLY BILL 341

AB 341 (Chesbro), was signed into law on October 6, 2011. AB 341 makes a legislative declaration that it is the policy goal of the state that not less than 75 percent of solid waste generated be source reduced, recycled, or composted by the year 2020. The goal primarily targets commercial or public entities that generate more than four cubic yards of commercial solid waste per week, or is a multifamily residential dwelling of five units or more to arrange for recycling services. AB 341 also requires the California Department of Resources Recycling and Recovery to provide a report to the Legislature that provides strategies to achieve that policy goal and also includes other specified information and recommendations by January 1, 2014.

CARB SCOPING PLAN

On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations.[36] CARB's Scoping Plan contains the main strategies California will implement to reduce CO_2 equivalent (CO_2eq) emissions by 174 MMT, or approximately 30 percent, from the state's projected 2020 emissions level of 596 MMT of CO_2eq under a BAU scenario (This is a reduction of 42 MMT CO_2eq, or almost ten percent, from 2002 to 2004 average emissions, but requires the reductions in the face of population and economic growth through 2020).

CARB's Scoping Plan calculates 2020 BAU emissions as the emissions that would be expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors (e.g., transportation, electrical power, commercial and residential, industrial, etc.). CARB used three-year average emissions, by sector, for 2002 to 2004 to forecast emissions to 2020. At the time CARB's Scoping Plan process was initiated, 2004 was the most recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.

In *Association of Irritated Residents, et al. v. California Air Resources Board, et al*., the Superior Court of California for the County of San Francisco (Superior Court) issued a Final Order on May 20, 2011 that prevents CARB from implementing a statewide GHG regulatory program. Although the court upheld the impact analysis contained in the environmental document for the Scoping Plan, the court found that the analysis of project alternatives was not sufficient for informed decision-making and public review under CEQA. The court found that CARB violated

[35] California Natural Resources Agency. *2009 California Climate Adaptation Strategy*, December 2009.

[36] California Air Resources Board, *Climate Change Scoping Plan, A Framework for Change*, December 2008.

CEQA by failing to fully evaluate possible alternatives to the measures described in the Scoping Plan, and focused specifically on the cap and trade program. The court noted that CEQA requires that CARB undertake a similar analysis of the impacts of each alternative so that the public may know not only why cap and trade was chosen, but also why the alternatives were not.

It should be noted that the Superior Court held in the favor of CARB on all substantive challenges to the State's compliance with AB 32 mandates. The Court stated that "as the agency with technical expertise and the responsibility for the protection of California's air resources, CARB has substantial discretion to determine the mix of measures needed to 'facilitate' the achievement of GHG reductions."[37]

On June 1, 2011, CARB filed a notice of appeal with the Court of Appeal, First Appellate District and followed up its appeal with a Petition for a Writ of Supersedeas, asking the First Appellate District to stay the Superior Court's decision. CARB's intent was to clarify the scope of the order, which enjoins CARB's implementation of all measures in the Scoping Plan, including programs like improved energy efficiency, clean car standards, and low-carbon fuel regulations. The First Appellate District granted CARB's Petition for Writ of Supersedeas, staying the Superior Court's injunction and allowing CARB to move forward with Scoping Plan implementation until the Court of Appeal renders a decision or issues another order. As a result of the lawsuit, CARB has adjusted the implementation schedule for the cap and trade program and compliance obligations have been pushed back.

CARB also released a *Supplement to the AB 32 Scoping Plan Functional Equivalent Document* on June 13, 2011, which is designed to address the CEQA flaws first identified by Superior Court. The Supplement provides an expanded analysis of the five alternatives to the Scoping Plan, including a no project alternative, a variation of the proposed combination of reduction measures proposed in the Scoping Plan, and three alternatives based on specific programs including cap-and-trade, source-specific regulatory requirements, and a carbon fee or tax.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

The Southern California Association of Governments (SCAG) is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG serves as the Federally designated metropolitan planning organization for the Southern California region and is the largest metropolitan planning organization in the United States. With respect to air quality planning, SCAG has prepared the *Regional Comprehensive Plan: Helping Communities Achieve a Sustainable Future* for the region, which focuses on transportation and growth management and forms the basis for the land use and transportation control portions of the *2007 Air Quality Management Plan for the South Coast Air Basin*. SCAG is responsible under the Federal Clean Air Act for determining conformity of projects, plans, and programs with the South Coast Air Quality Management District (SCAQMD).

[37] Superior Court of California, County of San Francisco, *Statement of Decision: Association of Irritated Residents, et al v. California Air Resources Board*, March 18, 2011.

Local

ORANGE COUNTY

The Orange County Sustainable Communities Strategy (OC SCS) is a subregional strategy created by a joint committee of representatives from the Orange County Council of Governments (OCCOG) and the Orange County Transportation Authority (OCTA) called the OCCOG/OCTA Joint Working Committee. This Committee created a strategy to meet the requirements of SB 375 and the mutual agreements with the Southern California Association of Governments (SCAG) with a plan to reduce GHGs that all local jurisdictions in Orange County could support.

SB 375 (Steinberg, Statutes of 2008) states that "a subregional council of governments and the county transportation commission may work together to propose the sustainable communities strategy (SCS) and an alternative planning strategy (APS) for that subregional area." In addition, SB 375 authorizes that SCAG "may adopt a framework for a subregional SCS or a subregional APS to address the intraregional land use, transportation, economic, air quality, and climate policy relationships."

The OC SCS includes technical data, best management practices, and local priorities - both land use and transportation oriented - that have an effect on vehicle transportation and its air quality outcomes. The Orange County SCS reflects the input of local jurisdictions, stakeholders, and the general public to profile Orange County's existing commitment to future change in Countywide growth.

CITY OF FULLERTON

The City of Fullerton has implemented a number of policies and programs to assist the community in preserving the local environment. Existing programs and policies relevant to community GHG emissions reductions include the following:

- ***Water Efficient Landscaping Ordinance.*** Under Section 15.50.025(D) of the City's Municipal Code, each landscaped area shall use native and appropriate non-native plants adapted to site conditions, climate, and design intent to support biodiversity, reduced pesticide use, and water conservation, with particular avoidance of the use of invasive plant species defined by the California Invasive Plant Council. Section 15.50.080(B) states that irrigation systems shall be regularly maintained and evaluated to utilize the minimum amount of water required to maintain plant health. Broken or damaged parts shall be replaced. Like-for-like replacements require no approval. Modifications shall be reviewed pursuant to Section 15.50.070.

- ***Water Conservation Ordinance.*** Section 12.06 of the City's Municipal Code is the Water Supply Shortage Conservation Plan. Under this code, the following uses of water are prohibited at all times:

  – *Permitting the excess use or loss of water through breaks, leaks, or other malfunctions in the water user's plumbing or distribution system for any period of time after such loss of water should have reasonably been discovered and corrected;*

- *No water runoff from landscaped areas into adjoining streets, sidewalks, or other paved areas due to incorrectly-directed or incorrectly-maintained sprinklers or excessive watering shall be allowed;*

- *No water shall be used to clean, fill, or maintain levels in decorative fountains, or other similar aesthetic structures, unless such water is part of a recycling system;*

- *Washing of motor vehicles, trailers, boats, and other types of mobile equipment shall be done only with a hand-held water container or a hose equipped with a positive shut-off nozzle for quick rinses, except for washing done at the immediate premises of a commercial car wash or with reclaimed water,*

Effective one (1) year after the adoption of this chapter, the following uses of water are prohibited:

- *Installation of single pass cooling systems in buildings requesting new water connections; and*

- *Installation of non-recirculating systems in new conveyor car wash systems and new commercial laundry systems.*

- ***Household Waste, Green Waste, and Recycling.*** In response to various environmental concerns and the State of California Waste Management Act (AB 939), the City is committed to reduce the amount of waste sent to the landfills. The City has contracted with MG Disposal to collect household waste, green waste, and recyclables. These items are source separated and collected from single-family residential areas. Multi-family residential, commercial, and industrial waste are collected and sorted at a Material Recovery Facility (MRF). The City and MG Disposal offer information on additional waste disposal locations and hazardous waste drop offs.

FULLERTON'S GHG EMISSIONS AND REDUCTION TARGET

Baseline and Projections

In 2009, the City of Fullerton generated 1,757,359 $MTCO_2eq$. Transportation-related activities account for the majority of the City's GHG emissions (approximately 66.2 percent). Approximately 16.3 percent of Fullerton's community-wide GHG emissions are attributed to residential uses. Commercial uses account for approximately 8.8 percent. Industrial uses and solid waste disposal account for the remaining 8.7 percent of community-wide GHG emissions. In the short term, transportation emissions are expected to decrease because of lower emissions from newer vehicles. These decreased emissions would likely outweigh expected increases in vehicle miles traveled (VMT). However, in the long term, projected increases in VMT outweigh decreased vehicle emissions resulting from improved fuel efficiency. Thus, the City's GHG emissions would be expected to increase to approximately 1,826,747 $MTCO_2eq$ in

2020, and would continue to increase throughout buildout of The Fullerton Plan. Additional information regarding the City's baseline and projected GHG emissions is provided in Chapter 2, *Emissions Inventory*.

Implementation

To meet its GHG emission reduction targets, the City needs to prioritize actions, mobilize residents, business owners, and staff, and work with neighboring jurisdictions and regional agencies to create feasible solutions. Additional information regarding the City's baseline and projected GHG emissions is provided in Chapter 4, *Implementation*.

Approach

Applying CAP measures to obtain tangible results requires concrete action steps and the flexibility to change as economic, political, and environmental conditions demand. Chapter 4 outlines the specific action steps that will implement each measure for which GHG emission reductions have been quantified. The City has provided an implementation timeframe and responsible departments for each action step. Additionally, the City has selected performance indicators and monitoring and reporting requirements that will be used to evaluate the success of each measure.

The City's Community Development Department will oversee the tracking and reporting of progress toward achieving the City's GHG emission reduction target of 15 percent below 2009 levels by 2020.[38] The City Council will be provided annual reports on the progress made toward achieving the reduction target as a whole, and for each quantified measure. If the measures do not achieve or surpass the expected GHG reductions, the City will examine ways to increase measure performance or create new measures capable to compensate for missed emission reductions.

Plan Adjustments and Flexibility

The CAP represents the City's aggressive effort to respond to the challenge of climate change at the time of preparation. The topic of climate action planning is changing frequently and rapidly evolving. Over the next decade, new information, GHG reduction methods, and legislation are likely to develop. In order to remain effective, the CAP must evolve over time. Therefore, the CAP will be reviewed and modified on a regular basis to identify potential plan update needs. These reviews will evaluate improvements to climate science, explore new opportunities for GHG reduction and climate adaptation, and respond to changes in climate policy.

[38] In the CARB Scoping Plan, "today's levels" are based on the statewide GHG inventory for 2005. However, cities and counties are encouraged to set a 15 percent GHG reduction target for both municipal operations and the community as a whole based on the most current GHG inventory conducted.

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Chapter 2.0

Emissions Inventory

CHAPTER 2.0
EMISSIONS INVENTORY

This section describes Fullerton's greenhouse gas (GHG) emissions inventory. The baseline emissions inventory is based on California Air Resources Board (CARB) and the International Council for Environmental Initiatives (ICLEI)—Local Governments for Sustainability protocols and provides emissions for both community-wide and municipal sources for Year 2009. It should be noted that the comprehensive Fullerton Plan uses 2009 as the year for the environmental conditions baseline.

The inventory was compiled using ICLEI's Clean Air Climate Protection (CACP) software. The emissions sources represent the total GHG emissions occurring within the City and include the major such as including residential, commercial, and industrial buildings; transportation; water conveyance; solid waste; and municipal operations. The GHG emissions from these sectors are associated with numerous direct and indirect sources. Direct sources are attributed to combustion of fossil fuels and area source emissions from buildings. Indirect sources consist of emissions from electricity generation, solid waste, and water transport.

Once completed, these inventories provide the basis for creating an emissions forecast and reduction target, and enable the quantification of emissions reductions associated with implemented and proposed measures.

METHODOLOGY

An inventory of GHG emissions requires the collection of information from a variety of sectors and sources. Community emissions from electricity and natural gas are based on usage rates specific to each land use type and are calculated using emissions coefficients compiled by ICLEI. Transportation data, including vehicle miles traveled (VMT), are based on traffic data provided by Kimley-Horn Associates, Inc., whom conducted the traffic analysis for The Fullerton Plan. Solid waste data was based on generation factors as well as historic and projected generation data identified in The Fullerton Plan EIR and the *California Department of Resources Recycling and Recovery (CalRecycle)*. City staff were instrumental in providing data on municipal operations.

Compiled data were entered into the CACP software to create a community emissions inventory and a municipal emissions inventory. The community inventory represents all the energy used and waste produced within Fullerton and its contribution to GHG emissions. Municipal sources represent all City operated buildings and vehicles, City employee commute, solid waste, water delivery facilities, wastewater facilities, and street lights. The municipal inventory is a subset of the community inventory, and includes emissions derived from internal government operations.

Separate emissions inventories for community and municipal operations are generally created since the government is committed to action on climate change, and has a higher degree of control to achieve reductions in its own municipal emissions than those created by the community at large. Additionally, by proactively reducing emissions generated by its own activities, the City of Fullerton takes a visible leadership role in the effort to address climate change. This is important for inspiring local action in Fullerton, as well as for inspiring other communities.

When calculating the emissions inventory, all energy consumed in the City was included. As a result, even though the electricity used by Fullerton's residents is produced elsewhere, the energy and emissions associated with energy consumption appears in the City's inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full ownership of the impacts associated with its energy consumption, regardless of whether the generation occurs within the geographical limits of the community. Additionally, the energy consumption is a result of activities that are within the City's regulatory authority.

Clean Air and Climate Protection Software

The CACP software estimates emissions derived from energy consumption and waste generation within a community. Emissions are determined using specific factors (or coefficients) according to the type of fuel used. Emissions are aggregated and reported in terms of carbon dioxide equivalent units (CO_2eq). Converting all emissions to CO_2eq units allows for the consideration of different GHGs in comparable terms. For example, methane is 21 times more powerful than CO_2 in its capacity to trap heat, so the model converts one ton of methane emissions to 21 tons of CO_2eq.

The emission coefficients and methodology employed by the software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change (1996 *Revised IPCC Guidelines for the Preparation of National GHG Emissions Inventories*), the *U.S. Voluntary GHG Reporting Guidelines* (EIA form1605), and, for emissions generated from solid waste, the EPA's Waste Reduction Model (WARM).

GHG EMISSIONS SECTORS

CACP separates the GHG emissions inventory into community-wide and government-related emissions. Community-wide emissions represent the total GHG emissions originating from activity within each sector throughout the community. Government-related emissions, although separated in CACP, are considered a subset of the community-wide (i.e., total) GHG emissions. CACP calculates GHG emissions from energy consumption, transportation, and solid waste, which are further discussed below.

Energy Consumption

Energy related emissions are from the consumption of both electricity and natural gas. These emissions are both direct (e.g., building energy consumption) and indirect (e.g., produced off-site from energy production and water consumption [including water treatment and delivery]). The emissions inventory used electricity and natural gas usage rates for residential, commercial, and industrial land uses for the year 2009 from the California Energy Commission (CEC) California Grid Average. The energy consumption data separated private users from government-operated facilities (i.e., City owned).

In order to calculate GHG emissions from natural gas and electricity consumption, ICLEI obtained California-specific emission coefficients. For natural gas consumption, a 2009 emission coefficient (kilograms of CO_2 per million British thermal units [kg CO_2/MMBtu]) for natural gas delivery was used within CACP for both community-wide and government-related energy use. The specific natural gas emission coefficient used to calculate GHG emissions was

verified by California Climate Action Registry (CCAR) and the CEC. Similar to natural gas consumption, a 2009 emission coefficient (pounds of CO_2 per kilowatt [lbs CO_2/kWh]) was used to calculate GHG emissions associated with electricity delivery, which is also verified by CCAR.

Transportation

Fullerton's transportation sector includes emissions generated from VMT. Kimley-Horn and Associates, Inc. worked with the Orange County Transportation Authority (OCTA) to determine the vehicle activity data (i.e., VMT) occurring on local roadways and freeway ramps within the City limits. In order to determine VMT within the City, OCTA performed a select link analysis for all trips that originated and ended in the City of Fullerton for all time periods. Daily traffic volumes were then calculated by summing traffic volumes for each time period. The VMT data was calculated by multiplying the traffic volumes for each link by the length of each link. Additionally, City staff provided vehicle and VMT data for the Municipal (i.e., City) vehicle fleet.

ICLEI used CARB's Emission Factors model (EMFAC2007) to obtain Orange County-specific emission coefficients for vehicle fuel distribution, vehicle fuel efficiencies, and emission factors. Orange County-specific emissions factors data was only used for community-wide transportation data. The City provided municipal vehicle fleet data with specific information regarding fuel and vehicle types. The CACP software also used EMFAC2007 assumptions to generate emission factors for the City vehicle fleet.

Solid Waste

Emissions from waste result primarily from organic waste occurring at landfills where the waste is disposed. Methane (CH_4) is the primary GHG from waste and the emissions result from chemical reactions and microbes acting upon the waste as the biodegradable materials break down. Solid waste generation and disposal data was obtained from CalRecycle (formerly the California Integrated Waste Management Board [CIWMB]). CACP provides GHG emission coefficients for various solid waste categories. These national default emission coefficients were used to calculate GHG emissions associated with solid waste disposal. The only alteration made to these emission coefficients was to set all waste category sequestration rates to zero in order to avoid the City taking credit for downstream emissions sequestration without also accounting for upstream emissions associated with production, transport, and consumption.

BASELINE GHG EMISSIONS INVENTORY

Community Sector

Table 2-1, *Baseline (Year 2009) Community-Wide GHG Emissions Inventory*, presents Fullerton's 2009 community-wide GHG emissions and the percent contribution of each emissions sector. As shown below, transportation-related activities account for the majority of the City's GHG emissions (approximately 66.2 percent). Approximately 16.3 percent of Fullerton's community-wide GHG emissions are attributed to energy consumption associated with natural gas and electricity usage from residential uses. Energy consumption from commercial retail, office, and institutional uses account for approximately 8.8 percent. Energy

consumption from industrial uses make up 6.8 percent, and solid waste disposal makes up the remaining 1.9 percent.

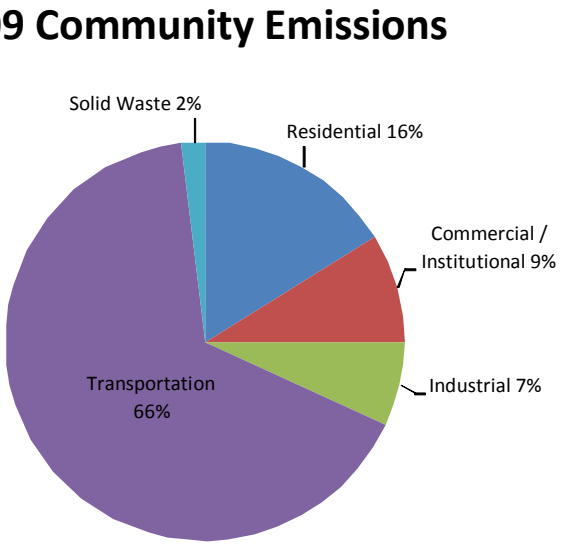
Table 2-1
Baseline (Year 2009) Community-Wide GHG Emissions Inventory

Community Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Residential	278,485	16.3
Commercial/Institutional		
College/University	42,954	2.5
High Schools/Elementary Schools	3,955	0.2
Commercial/Retail	85,569	5.0
Office	14,282	0.8
Other[1]	4,371	0.3
Industrial	116,056	6.8
Waste	32,278	1.9
Transportation	1,133,886	66.2
TOTAL[2]	**1,711,836**	**100**

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Notes:
1. Other includes places of worship and golf courses.
2. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.



Municipal Sector

Municipal emissions include energy use from City facilities such as water delivery facilities as well as government buildings, vehicle fleets, streetlights, and City employee commuting. Municipal sector emissions represent an opportunity for the City to demonstrate how to reduce GHG emissions. Table 2-2, *Baseline (Year 2009) Municipal Operations GHG Emissions Inventory*, presents government-related GHG emissions and the percent contribution of each emission sector. Approximately 43.7 percent of government-related GHG emissions are generated from water pumping, treatment, and delivery and wastewater treatment accounts for 8.0 percent. Electricity consumption of streetlights and traffic signals represent 20.8 percent. GHG emissions from employee commute total approximately 5.6 percent and the City's vehicle fleet represents 2.9 percent of government-related emissions, while buildings and facilities account for just 14.4 percent of annual GHG emissions.

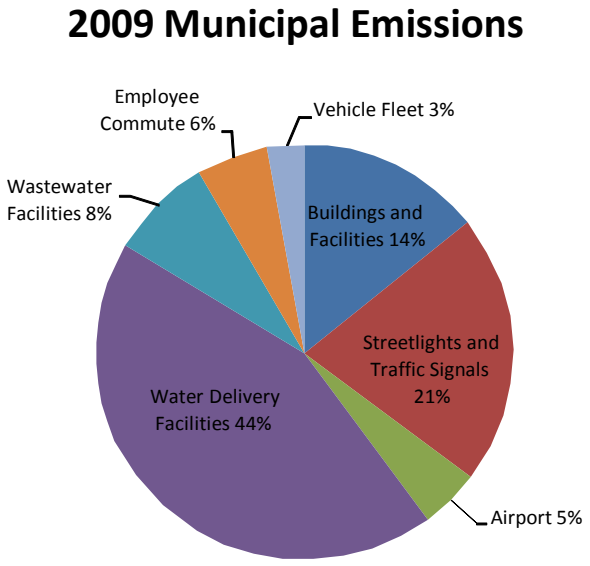
Table 2-2
Baseline (Year 2009) Municipal Operations GHG Emissions Inventory

Municipal Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Buildings and Facilities	6,536	14.4
Streetlights and Traffic Signals	9,476	20.8
Airport Facilities	2,165	4.8
Water Delivery Facilities (local and import)	19,877	43.7
Wastewater Facilities	3,627	8.0
Employee Commute	2,536	5.6
Vehicle Fleet	1,305	2.9
Total[1]	**45,523**	**100**

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Notes:
1. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.



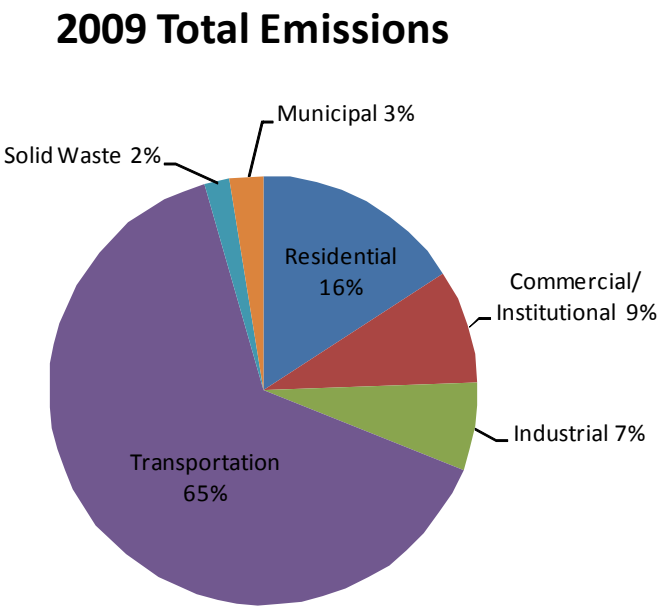
TOTAL BASELINE GHG EMISSIONS

Total Baseline GHG emissions include both the Community Sector and the Municipal Sector. As indicated in Table 2-3, *Total Baseline (Year 2009) GHG Emissions*, the Citywide GHG emissions are 1,757,359 metric tons (MT) CO_2eq per year. On a per capita basis, the annual emissions for each person in the City is 12.99 $MTCO_2$eq.

Table 2-3
Total Baseline (Year 2009) GHG Emissions

Sector	GHG Emissions	
	Total $MTCO_2$eq/year	CO_2eq (percent)
Community Sector	1,711,836	97.4
Municipal Sector	45,523	2.6
Total	**1,757,359**	**100**

GHG = greenhouse gas; $MTCO_2$eq/yr = metric tons of carbon dioxide equivalent per year
Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.



PROJECTED EMISSIONS

To determine the GHG emission reductions necessary to achieve Fullerton's target (15 percent reduction in emissions from 2009 emission levels by 2020), the City's GHG emissions were projected for The Fullerton Plan buildout year, then GHG emissions were projected for year 2020 under a trend scenario. The trend scenario is based on future growth and development anticipated in The Fullerton Plan as well as future year consumption rates for energy, transportation, water transport, and waste. The existing and projected emissions are presented in Table 2-4, *Baseline and Projected 2020 and 2030 Emissions*. The emissions forecast

estimates future emissions under a Business As Usual (BAU) scenario. The BAU scenario assumes that no effort has been made to reduce emissions. Therefore, the future emissions depicted in Table 2-4 present how GHG emissions may increase in Fullerton if no reduction programs are implemented.

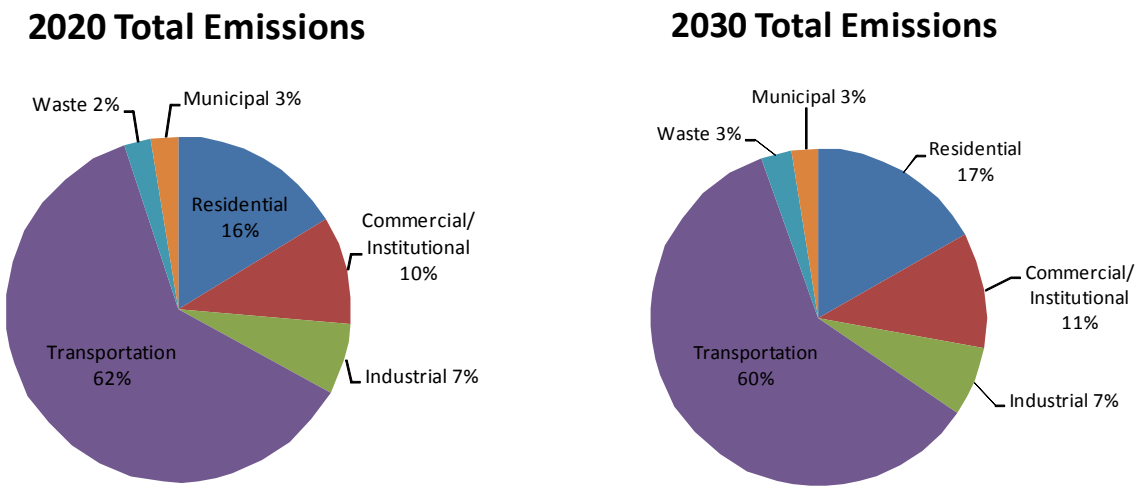
Table 2-4
Baseline and Projected 2020 and 2030 Emissions

Emissions Sector	GHG Emissions					
	2009 Baseline		2020 Projected		2030 Projected	
	$MTCO_2eq/yr$	% of Emissions[1]	$MTCO_2eq/yr$	% of Emissions[1]	$MTCO_2eq/yr$	% of Emissions[1]
COMMUNITY SECTOR						
Residential	278,485	16.3	306,472	16.8	331,915	17.2
Commercial/Institutional						
College/University	42,954	2.5	45,601	2.5	48,007	2.5
High Schools/ Elementary Schools	3,955	0.2	3,955	0.2	3,955	0.2
Commercial/Retail	85,569	5.0	96,971	5.3	107,336	5.6
Office	14,282	0.8	37,585	2.1	58,770	3.0
Other[2]	4,371	0.3	4,334	0.2	4,301	0.2
Industrial	116,056	6.8	123,347	6.8	129,975	6.7
Transportation	1,133,886	66.2	1,162,553	63.6	1,188,615	61.5
Waste	32,278	1.9	45,927	2.5	58,336	3.0
Community Sub-Total[3]	***1,711,836***	***100***	***1,826,747***	*100*	***1,931,211***	***100***
MUNICIPAL SECTOR						
Buildings and Facilities	6,536	14.4	6,879	14.1	7,190	13.9
Streetlights & Traffic Signals	9,476	20.8	9,973	20.5	10,424	20.2
Airport Facilities	2,165	4.8	2,279	4.7	2,382	4.6
Water Delivery Facilities	19,877	43.7	21,649	44.4	23,260	45.1
Wastewater Facilities	3,627	8.0	4,081	8.4	4,494	8.7
Employee Commute	2,536	5.6	1,902	3.9	1,325	2.6
Vehicle Fleet	1,305	2.9	1,951	4.0	2,539	4.9
Municipal Sub-Total[3]	***45,523***	***100***	***48,715***	***100***	***51,616***	***100***
Grand Total (Community and Municipal Sectors)[3]	**1,757,359**	N/A	**1,875,462**	N/A	**1,982,827**	N/A

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Notes:
1. The percentage of emissions refers to the respective sectors (either community or municipal) and not to the combined total.
2. Other includes places of worship and golf courses.
3. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.



Growth and development under a 2030 BAU scenario would continue along a similar trend as under the 2020 BAU conditions. Assuming that the same type of current emissions-generating practices continue to occur within Fullerton, the City's GHG emissions would be anticipated to increase from 1,757,359 $MTCO_2eq$ in 2009 to 1,982,827 $MTCO_2eq$ in 2030. This represents a 12.8 percent increase from the 2009 baseline level in 2030. In comparison, the City's projected population is expected to increase 12.7 percent by 2030 from 2009.[1] Therefore, if current emissions-generating practices continue, Fullerton's GHG emissions are expected to increase at a similar rate to its population in 2030.

Under a BAU scenario, the City's GHG emissions (municipal and community) would be anticipated to increase from 1,757,359 $MTCO_2eq$ in 2009 to 1,875,462 $MTCO_2eq$ in 2020. This represents a 6.7 percent increase from the 2009 baseline level. In comparison, the City's projected population is expected to increase 10.0 percent by 2020 from 2009.[2] Fullerton's projected growth is anticipated to occur near existing and future job centers, which would positively impact transportation patterns and therefore would potentially be beneficial to GHG emission reductions.

GHG REDUCTION TARGET

The City of Fullerton recognizes the importance of reducing GHG emissions. Clearly defined emissions reduction targets will provide City decision makers and the community with a clear direction for Fullerton's GHG emissions management efforts, and will provide milestones against which progress can be evaluated over time. This quantitative target coupled with strategies and actions in this CAP the will allow Fullerton to have greater control of the amount of GHGs emitted into the atmosphere.

[1] Southern California Association of Governments (SCAG), *Adopted 2008 RTP Growth Forecast by City*, http://www.scag.ca.gov/forecast/index.htm. Accessed May 3, 2011.

[2] Ibid.

Under AB 32, the State has committed to reducing GHG emissions to 1990 levels by 2020. Based on the CARB *Scoping Plan*, reducing GHG emissions to 1990 levels means cutting approximately 30 percent from BAU emission levels projected for 2020, or about 15 percent from today's levels.[3] The CARB *Scoping Plan* projects future emissions by comparing potential reductions from various measures to a BAU scenario. The BAU scenario represents future GHG emissions without the implementation of reduction measures. As a result, the CARB *Scoping Plan* outlines the State's strategy to achieve the 2020 GHG emissions limit with a comprehensive set of actions that will be developed by 2012.

Consistent with the CARB *Scoping Plan*, the City of Fullerton has chosen a reduction target of 15 percent below their current (2009 baseline) emissions levels by 2020. This reduction trend would continue through The Fullerton Plan buildout year. The 15 percent below current emissions reduction target will contribute to the stabilization of global GHG emission concentrations and achievement of AB 32 goals. To attain the adopted target, Fullerton will need to reduce Citywide GHG emissions by 381,707 $MTCO_2eq$ by 2020; refer to Table 2-5, *GHG Emissions Summary and Reduction Target*. This represents a 20 percent reduction from projected 2020 GHG emissions levels which take into account population growth and BAU emissions generation.

To achieve these emissions reductions, the City will implement reduction strategies for each category of GHG emissions (e.g., transportation, energy consumption, water consumption, and waste disposal). Chapter 3 identifies GHG reduction measures capable of achieving this target, and describes the relationship of the City's local actions to statewide efforts to curb GHG emissions.

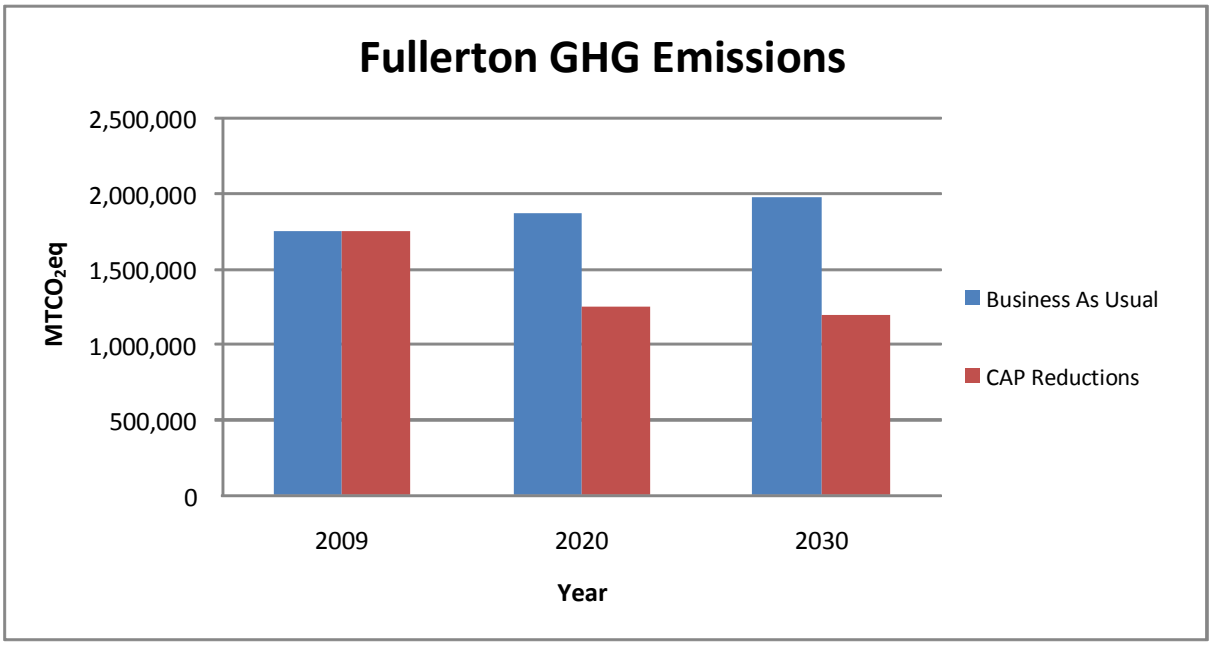
Table 2-5
GHG Emissions Summary and Reduction Target

Scenario[1]	GHG Emissions (MT CO_2eq/yr)
Total 2009 Baseline GHG Emissions	1,757,359
Total 2020 BAU projected GHG Emissions	1,875,462
Total 2030 General Plan Buildout projected GHG Emissions	1,982,827
Emissions Reduction Target (15 percent below 2009 emissions)	1,493,755
2020 GHG Emissions Reductions from BAU	381,707

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year; BAU = Business As Usual

Notes:
1. All scenarios refer to both community-wide and municipal emissions as the "total" amount of GHG emissions.

[3] In the CARB Scoping Plan, "today's levels" are based on the statewide GHG inventory for 2005. However, cities and counties are encouraged to set a 15 percent GHG reduction target for both municipal operations and the community as a whole based on the most current GHG inventory conducted.



A 15 percent reduction below 2009 baseline emissions levels requires a reduction of 381,706 $MTCO_2eq$ from the projected 2020 BAU levels of 1,875,460 $MTCO_2eq$.

Chapter 3.0

Climate Actions Strategies

CHAPTER 3.0
CLIMATE ACTION STRATEGIES

Assembly Bill 32, the Global Warming Solutions Act of 2006, requires a reduction of greenhouse gas (GHG) emissions to 1990 levels by 2020. The California Air Resources Board (CARB) is the lead agency for implementing AB 32, which set the major milestones for establishing the program. CARB met the first milestones in 2007: developing a list of discrete early actions to begin reducing GHG emissions, assembling an inventory of historic emissions, establishing GHG reporting requirements, and setting the 2020 emissions limit. As part of its mandate, CARB developed a Scoping Plan which outlined the State's strategy to achieve the 2020 GHG emissions limit. The Scoping Plan proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify energy sources, save energy, create new jobs, and enhance public health.

This "Approved Scoping Plan" was adopted by CARB at its December 11, 2008 meeting. In setting the reduction goal, the Scoping Plan identifies that reducing GHG emissions to 1990 levels means cutting approximately 30 percent from business-as-usual emission levels projected for 2020, or about 15 percent from today's levels. In response to the CARB Scoping Plan, the City of Fullerton has established a goal to reduce community-wide GHG emissions to 15 percent below baseline levels by 2020. It should be noted that the comprehensive general plan (The Fullerton Plan) uses 2009 as the year for the environmental conditions baseline.

This chapter describes the four strategies that Fullerton has crafted to achieve this target. Combined, these strategies will decrease GHG emissions by approximately 628,290 metric tons of carbon dioxide equivalent ($MTCO_2eq$) by 2020, enabling the community to contribute to global efforts to combat climate change. The strategies and emissions reductions measures within this section take into account projected growth within the City. Each of the strategies contains emission reduction measures from municipal and non-municipal operations. These measures are consistent with and build upon the Goals and Policies within The Fullerton Plan. Although Chapter 2, *Emissions Inventory*, of this CAP includes GHG inventories for Year 2030 (the buildout year associated with The Fullerton Plan), these are included only for informational purposes, as the reduction strategy that was chosen is set to comply with the AB 32 benchmark of year 2020. However, implementation of the GHG reduction measures in the CAP would ensure the GHG emissions are significantly reduced from the year 2030 business as usual (BAU) scenario.

The measures were developed from evaluating The Fullerton Plan existing conditions, identifying emission reduction opportunities – especially those embraced by the community realized through community outreach, reviewing best practices from other jurisdictions and organizations, and incorporating State and regional laws, guidelines, and recommendations.

The selected measures were recommended on the following criteria:

- *Is it technically possible to implement the measure and would the community support it?*
- *Does this measure create additional co-benefits (i.e., quality of life, public health, jobs/housing balance)?*

The four emission reduction strategies are as follows:

Transportation and Mobility Strategy.

Promote a balanced transportation system that promotes the use of public transportation and bicycles, reduces congestion, and helps encourage residents to engage in healthy and active lifestyles.

- The transportation and mobility strategy identifies opportunities to improve mobility such as walking, bicycling, and transit use, and to decrease the need to drive.

Energy Use and Conservation Strategy.

Reduce the carbon footprint of municipal operations to serve as a leader for the community and support the construction of buildings that are energy efficient and incorporate clean, renewable energy sources.

- The energy use and efficiency strategy recommends ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase use of renewable energy.

Water Use and Efficiency Strategy.

Conserve and protect water resources and promote efficiency through public education.

- The intent of this strategy is to conserve water through efficient use and conservation.

Solid Waste Reduction and Recycling Strategy.

Manage solid waste generation and diversion in order to achieve a zero-waste future.

- The strategy builds on past City successes by increasing waste diversion, reducing consumption of materials that otherwise end up in landfills, and increasing recycling.

Each strategy recommends measures and actions that will make the vision of the CAP a reality. Measures define the direction that the City will take to accomplish its GHG reduction goals. Actions define the specific steps that City staff and decision-makers will take over time.

SECTION STRUCTURE

This section is organized by strategy, objectives, measures, and actions. Each of the four strategies represents the primary ways to reduce GHG emissions in Fullerton. Each strategy begins with a statement and introduction to the overarching concepts that tie that particular strategy to GHG emission generation and potential reductions. This introduction is then followed by the component objectives, measures, and actions that translate to the City's vision to implementation. The measures correlate to applicable goals, policies, and actions from The Fullerton Plan to help the City achieve the objectives of this CAP. Actions are to be carried out by the assigned City employee/position. The following identifies the major components of each GHG reduction strategy:

- ***GHG Reduction Strategy.*** The four strategies for the Fullerton Climate Action Plan are described above and are essentially target areas to be addressed by the objectives and measures.

- ***Objective.*** Objectives define the programs, policies, and projects that the City would undertake to accomplish its GHG reduction targets.

- ***Measure.*** The measures directly correlate to Goals from The Fullerton Plan and the *Fullerton Bicycle Master Plan* and support the objectives.

- ***Measure Description.*** Measure descriptions provide important background information and describe the City's rationale and policy direction. Additionally, some descriptions provide detailed guidance that will be used in program implementation.

- ***Action and Performance Criteria.*** Detailed action steps and performance criteria are provided in a table following each measure description. Actions identify specific steps that the City will take to implement the measure. The table also identifies the responsible departments and establishes an implementation schedule for each action.

- ***GHG Reduction Potential.*** GHG reduction potential for each measure was calculated based on research data, findings, and guidance from public agencies, associations, and research institutes such as the Center for Clean Air Policy (CCAP), the Victoria Transport Institute (VTI), and the California Air Pollution Control Officers Association (CAPCOA). In several instances, combining measures lead to better emissions reductions than implementing a single measure by itself. These measures have been identified as "supporting measures." Supporting measures do not necessarily have a quantifiable GHG reduction potential of their own, but facilitate reductions of other associated measures. Therefore, measures that contribute to the reductions of other measures have been identified as supporting measures.

RESPONSIBILITY

The City's Community Development Department will oversee the implementation and monitoring of the GHG reduction strategies. Through this process, additional City Departments (e.g., Engineering, Administrative Services, Redevelopment/Economic Development, etc.) would be engaged to ensure the goal and reduction measures are achieved to realize the City's reduction target. Performance Criteria and the responsible departments are identified for each measure in order to enable staff, the City Council, and the public to track implementation and monitor overall CAP progress.

1. TRANSPORTATION AND MOBILITY STRATEGY

Promote a balanced transportation system that promotes the use of public transportation and bicycles, reduces congestion, and helps encourage residents to engage in healthy and active lifestyles.

Emissions from the transportation sector are the largest portion of total emissions. Efficient transportation systems conserve fuel, and reduce travel costs and expensive road repairs. Reducing the number and length of vehicle trips and engine idling reduces emissions. Generally, there are three methods to reduce GHG emissions from the transportation sector. One method is to implement policies that reduce dependence on personal motor vehicles and encourage alternative modes of transportation, such as public transit, cycling, and walking. Another method is to utilize vehicles that release fewer GHGs, such as hybrids, more fuel efficient vehicles, and vehicles that run on alternative fuels.

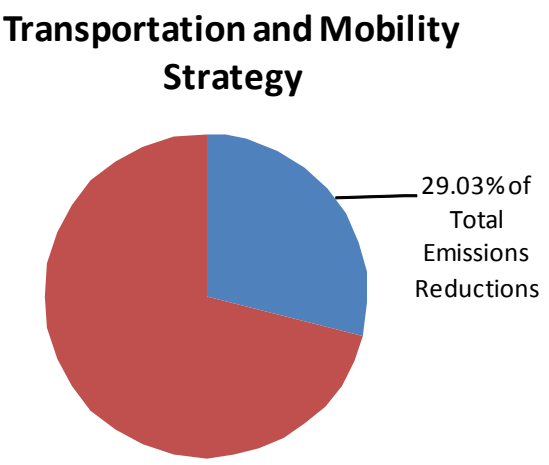
The City has established the *Fullerton Bicycle Master Plan* that sets forth a program for enhancements, improvements, and additions to the City's bikeways network to ensure that it meets the needs of users, now and in the future. The *Fullerton Bicycle Master Plan* recommends projects, identifies potential funding sources, and provides design guidelines to ensure a high-quality bicycle network. Implementation of the *Fullerton Bicycle Master Plan* would encourage alternative modes of transportation throughout Fullerton, reduce vehicle trips, and reduce GHG emissions. Applicable policies and goals of the *Fullerton Bicycle Master Plan* have been incorporated into this Transportation Strategy in order to quantify emissions reductions from bicycle infrastructure improvements and to facilitate seamless implementation of this CAP and the *Fullerton Bicycle Master Plan*.

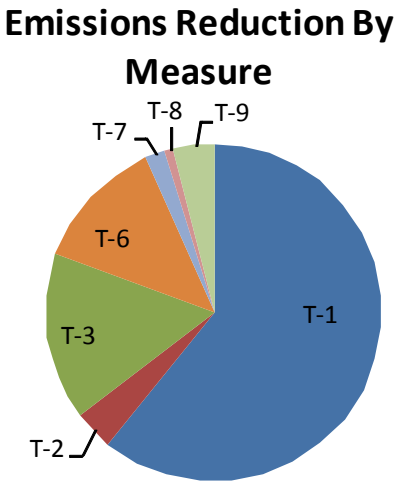
A final method to reduce GHG emissions from the transportation sector is to encourage "smart growth" or policies that promote efficient land use development. Smart growth reduces the need to travel long distances, facilitates transit and other non-automotive travel, increases the availability of affordable housing, employs existing infrastructure capacity, promotes social equity, helps protect natural assets, and maintains and reinforces existing communities. The following objectives and measures aim to reduce emissions from transportation using all three methods.

In 2011, the Orange County Transportation Authority (OCTA) and the Orange County Council of Governments (OC COG) released the Orange County Sustainable Communities Strategy (OC SCS). Pursuant to the requirements of SB 375, the Orange County SCS identifies various strategies to reduce GHG emissions within the Orange County SCAG sub-region. The strategies within the Orange County SCS focus on integrated transportation, land use, housing, and environmental planning to reduce GHG emissions from automobiles and light trucks. The objectives within the Transportation and Mobility Strategy of this CAP coincide with various SCS sustainable strategies. As indicated in the applicable actions below, the City of Fullerton can benefit greatly by coordinating with OCTA and OC COG to achieve their combined sustainability goals through developing an integrated transportation and land use system.

TRANSPORTATION AND MOBILITY REDUCTION MEASURES

Objective:	Reduce Vehicle Trips
T-1:	Reduction of Single Occupant Vehicle Trips
Objective:	**Promote Bicycle Use for Commuting and Recreation**
T-2:	Inter-Jurisdiction Connections
T-3:	Bicycle Transportation Plan
T-4:	Bicycle Use on All Streets
T-5:	Bicycling Safety and Convenience
Objective:	**Encourage Alternative Modes of Transportation**
T-6:	Circulation between Cities
T-7:	Infrastructure for Low and Zero Emission Vehicles
T-8:	Rail and Rapid Transit
T-9:	Car Sharing Pilot Program





Total Transportation and Mobility Strategy Emission Reductions = 182,026 $MTCO_2eq$

Objective A: Reduce Vehicle Trips

T-1 Reduction of Single Occupant Vehicle Trips

Measure Description: Support regional and sub-regional efforts to increase alternatives to and infrastructure supporting a reduction of single occupant vehicle trips. (P5.2)

Action	Target/Performance Criteria	GHG Reduction Potential
Conduct a travel/commute survey to determine the infrastructure necessary to encourage alternative transit modes that support a reduction of single occupant vehicle trips.	Complete travel/commute survey by 2015.	40,756 $MTCO_2eq$
Work with employers within the City to develop a Commute Trip Reduction Program (CTR) to encourage employees to carpool/rideshare. The program should also encourage employers to provide preferential carpool parking, flexible work schedules for carpools, vanpool assistance, and bicycle end-trip facilities.	Implement a voluntary trip reduction program by 2020	
Upgrade transit access and expand transit network.	Increase transit network coverage by 20 percent by 2020.	
Implement the planned development within The Fullerton Plan Focus Areas, which concentrate development and promote smart growth principles.	Implementation of The Fullerton Plan due to anticipated growth will facilitate transit oriented development and a healthy mix of land uses that reduce single occupant vehicle trips.	69,867 $MTCO_2eq$
Responsibility:	Engineering Department, Community Development Department, and City Manager's Office	

Objective B: Promote Bicycle Use for Commuting and Recreation

T-2 Inter-Jurisdiction Connections

Measure Description: Support efforts to maintain, expand and create new connections between the Fullerton bicycle network and the bicycle networks of adjacent cities, Orange County, and the region. (P6.2)

Action	Target/Performance Criteria	GHG Reduction Potential
Work with OCTA and OC COG to identify Fullerton's existing and planned bicycle networks that have the potential to connect to adjacent cities and regional trails.	Identify potential connections by 2014. Implement 60 percent of the connection projects by 2020 and 100 percent of the connection projects by 2030.	6,987 $MTCO_2eq$
Responsibility:	Engineering Department, Community Development Department, and City Manager's Office	

T-3 Bicycle Transportation Plan

Measure Description: Support projects, programs, and policies to maintain and update as necessary a Bicycle Transportation Plan prepared and approved pursuant to the California Streets and Highways Code to maintain eligibility for funding for State Bicycle Transportation Account funds. (P6.3)

Action	Target/Performance Criteria	GHG Reduction Potential
Actively implement short-term projects such as those identified in the *Fullerton Bicycle Master Plan* through the City of Fullerton's 5-Year Capital Improvement Program. Specific projects are to be determined by the Bicycle Users Subcommittee and approved by City Council.	Implement short-term projects identified by the Bicycle Users Subcommittee and approved by City Council by 2016.	29,111 $MTCO_2eq$
Implement medium- and long-term bicycle infrastructure improvements such as those identified in the *Fullerton Bicycle Master Plan.* Specific projects are to be determined by the Bicycle Users Subcommittee and approved by City Council..	Implement medium-term projects by 2020. Implement the long-term projects by 2030.	
Responsibility:	Engineering Department, Community Development Department, and City Manager's Office	

T-4 Bicycle Use on All Streets

Measure Description: Support projects, programs, policies and regulations to recognize that every street in Fullerton is a street that a bicyclist can use. (P6.4)

Action	Target/Performance Criteria	GHG Reduction Potential
Prioritize the improvements in the *Fullerton Bicycle Master Plan* that focus on improving signage and adding bicycle lanes.	Follow the implementation and prioritization timeline within the *Fullerton Bicycle Master Plan* (Chapter 7) and complete the short-term bicycle infrastructure improvements by 2016.	Supporting Measure.
Responsibility:	Community Development Department, Engineering Department, and City Manager's Office	

T-5 Bicycling Safety and Convenience

Measure Description: Support projects, programs, policies, and regulations that make bicycling safer and more convenient for all types of bicyclists. (P6.5)

Action	Target/Performance Criteria	GHG Reduction Potential
Amend the zoning ordinance to require shower facilities and dressing areas for significant new or redevelopment non-residential uses.	Amend the zoning ordinance by 2015.	Supporting Measure.
Create a bicycle sharing program.	Create a bicycle sharing program by 2020.	
Responsibility:	Community Development Department, Engineering Department, and City Manager's Office	

Objective C: Encourage Alternative Modes of Transportation

T-6 Circulation Between Cities

Measure Description: Support regional and sub-regional efforts to implement programs that coordinate the multi-modal transportation needs and requirements across jurisdictions, including but not limited to the Master Plan of Arterial Highways, the Commuter Bikeways Strategic Plan, the Signal Synchronization Master Plan, the Orange County Congestion Management Plan, and the Growth Management Plan. (P5.1)

Action	Target/Performance Criteria	GHG Reduction Potential
Work with OCTA to establish Bus Rapid Transit (BRT) within the City. The Orange County SCS has prioritized one of the first three BRT projects to occur along Harbor Boulevard between Fullerton and Costa Mesa.	Establish a BRT line within the City by 2020.	23,289 $MTCO_2eq$
Provide feedback to OCTA for their Transit System Study which is being conducted to determine where and how to increase public transportation service oriented to existing and future land use and maximizing ridership.	Provide feedback to OCTA by 2014.	Supporting Measure.
Responsibility:	Engineering Department, Community Development Department, and City Manager's Office	

T-7 Infrastructure for Low and Zero Emission Vehicles

Measure Description: Support projects, programs, policies, and regulations to encourage the development of private and/or public infrastructure facilitating the use of alternative fuel vehicles. (P5.16)

Action	Target/Performance Criteria	GHG Reduction Potential
Establish alternative fuel stations within the City for public use.	Make alternative fuels available at 4 locations within the City by 2020 and 6 locations by 2030. Alternative fuels can be co-located at gasoline fueling stations.	2,906 $MTCO_2eq$
Continue to procure fuel-efficient and alternative fuel vehicles for municipal vehicle fleet.	20 percent alternative fuel vehicles in the City's fleet by 2020. 40 percent alternative fuel vehicles in the City's fleet by 2030.	390 $MTCO_2eq$
Collaborate with regional, state, and federal agencies to promote the use of alternative fuels and increased vehicle fuel efficiency standards.	Ongoing.	Supporting Measure.
Responsibility:	Community Development Department, Engineering Department, and City Manager's Office	

T-8 Rail and Rapid Transit

Measure Description: Participate in the planning efforts for regional and inter-state rail and rapid transit projects to represent the interests of the City. (A5.3)

Action	Target/Performance Criteria	GHG Reduction Potential
Work with OCTA and Metrolink to expand parking facilities at the Fullerton Metrolink Station.	Expand parking facilities by 2015.	1,744 $MTCO_2eq$
Work with OCTA and Metrolink to facilitate the Metrolink Service Expansion Program (MSEP) and the M2 Go Local Program to increase the frequency of rail service through Orange County.	Collaborate with Metrolink on an ongoing basis.	Supporting Measure.
Responsibility:	Engineering Department, Community Development Department, and City Manager's Office	

T-9 Car Sharing Pilot Program

Measure Description: Explore the potential for a car sharing pilot program to be implemented in one or more of the City's Focus Areas. (A21.2)

Action	Target/Performance Criteria	GHG Reduction Potential
Conduct a study to determine the optimal locations for a car sharing program.	Complete the car sharing study by 2015.	6,975 $MTCO_2eq$
Implement the car sharing program in at least one Focus Area.	Implement the car sharing program by 2020.	
Responsibility:	Engineering Department, Community Development Department, and City Manager's Office	

2. ENERGY USE AND CONSERVATION STRATEGY

Reduce the carbon footprint of municipal operations to serve as a leader for the community and support the construction of buildings that are energy efficient and incorporate clean, renewable energy sources.

ENERGY EFFICIENCY

Energy generation is the second largest source of GHG emissions. Thus, strategies to conserve energy and use it more efficiently in Fullerton's operations and in the community will help reduce GHG emissions. In addition, energy efficiency and conservation measures save money and resources. City buildings, equipment, and infrastructure all use energy. Typically, newer purchases and installations tend to be more energy efficient, but opportunities to enhance efficiency still exist. Buildings can be made more efficient by upgrading insulation and installing low emissive glass, using high-efficiency lighting with timers and sensors, installing cool roofs, and simply adjusting heating and cooling levels.

Increasing energy efficiency throughout the community has immense potential to both reduce GHG emissions and save money. A wealth of resources exists to assist municipalities in this regard. For example, the Energy Star program offers energy efficient products and tools for improving energy management. Promoting Energy Star resources to both businesses and residents is a good way to achieve increased energy efficiency. Other methods to increase community energy efficiency include subsidizing energy management services such as energy audits for residents and businesses. Ensuring that developers and building contractors are trained on energy conservation and efficiency is also within the City's purview.

A commitment to cost effective highly efficient construction in municipal facilities is one way the City can reduce GHG emissions from the built environment. In addition, the City could adopt the *2010 California Green Building Standards Code* (CALGreen Building Standards) voluntary measures for residential and non-residential buildings as mandatory. The City could lead by example and encourage the community to reduce their energy consumption.

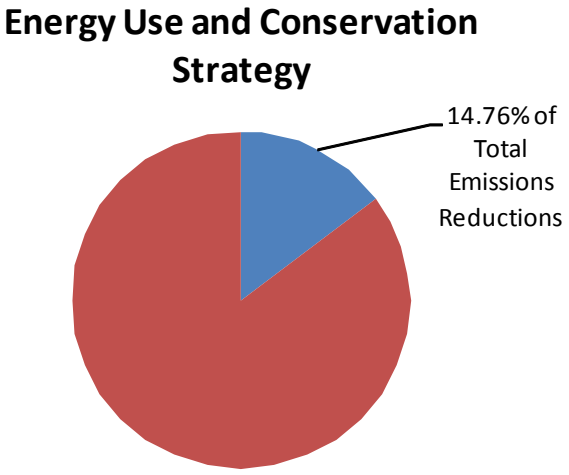
The CALGreen building standards sets new mandatory measures for minimum standards that all new structures can realize to significantly reduce the state's overall carbon output. The code provides standards for residential and non-residential structures. In addition to the basic mandatory measures, CALGreen provides optional or voluntary measures to further reduce impacts, which are grouped as Tier 1 and Tier 2. Tier 1 measures are not costly and simple to implement. Tier 2 measures are more extreme and can be costly. CALGreen standards will evolve over time to become more stringent. At this time, CALGreen standards (2010 California Building Code) are required by the City of Fullerton. It is likely that Tier 1 measures will become mandatory in the future updates of the CALGreen code.

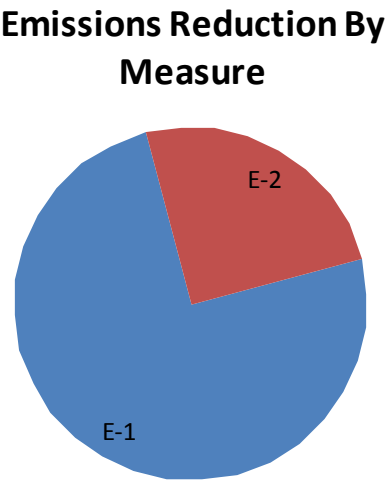
ALTERNATIVE ENERGY

Sources of renewable energy include solar, wind, biomass, and geothermal. Hydrogen fuel cells are renewable energy sources that hold promise but require further research and innovation before they are as practical and possible to implement as other options. Renewable energy sources offer the potential for a clean, decentralized energy source that can significantly impact the municipality's GHG emissions. Fullerton will work to build on current efforts to integrate alternative energy into the community's power scheme. Energy generated from renewable sources produces less GHG emissions than energy generated from conventional sources; low carbon fuels are those that are formulated to produce fewer GHG emissions.

ENERGY USE AND CONSERVATION REDUCTION MEASURES

Objective:	Promote Renewable Energy Sources and Onsite Energy Generation
E-1:	GHG Emissions from Electrical Generation
Objective:	**Promote Energy Efficient Design**
E-2:	Energy- and Resource-Efficient Design
E-3:	Energy Efficient Retrofits
E-4:	Efficient Use of Energy Resources in Residential Development
Objective:	**Promote Sustainable Development**
E-5	Sustainable Regional Revitalization Efforts





Total Energy and Conservation Strategy Emission Reductions = 92,740 $MTCO_2eq$

Objective A: Promote Renewable Energy Sources and Onsite Energy Generation

E-1 GHG Emissions from Electrical Generation

Measure Description: Support regional and sub-regional efforts to reduce greenhouse gas emissions associated with electrical generation through energy conservation strategies and alternative/renewable energy programs. (P22.2)

The CALGreen Tier 1 voluntary measures for new structures are simple and inexpensive ways to improve building efficiency. CALGreen Section 306.1 states that voluntary measures are intended to further encourage building practices that improve public health, safety, and general welfare by promoting the use of building concepts which minimize the building's impact on the environment, promote a more sustainable design and high-performance educational facilities.

Residential voluntary measures are provided for planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality.

Examples of voluntary measures include:

Planning and Design

- Site Selection: Use of an infill or greyfield site, or an EPA-recognized and remediated Brownfield site (Section A4.103).
- Deconstruction and Reuse of Existing Materials: Existing buildings on the site are deconstructed and the salvaged materials are reused. Reused materials or products must comply with current building standards requirements or be an accepted alternate method or material (Section A4.105).

Energy Efficiency

- Lighting: Building lighting consists of at least 90 percent ENERGY STAR qualified hard-wired fixtures (Section A4.209.1).
- Appliance Rating: Each appliance provided by the builder meets ENERGY STAR if an ENERGY STAR designation is applicable for that appliance (Section A4.210.1).

Water Efficiency and Conservation

- Indoor Water Use: The maximum flow rate at a kitchen sink faucet shall not be greater than 1.5 gallons per minute at 60 pounds per square inch (psi) (Section A4.303.1).
- Water Reuse Systems: Alternative plumbing piping is installed to permit the discharge from the clothes washer or other fixtures to be used for an irrigation system in compliance with Chapter 16A of the *California Plumbing Code* (Section A4.305.1 Graywater).

Material Conservation and Material Recovery

- Efficient Framing Techniques: Beams and headers and trimmers are sized and installed as specified in California Residential Code (CRC) Tables R502.5(1) and R502.5(2). Other calculations acceptable to the enforcing agency which use the minimum size member for the tributary load shall be acceptable (Section A4.404.1 Lumber Size).

- Construction Waste Reduction, Disposal and Recycling: Nonhazardous construction and demolition debris generated at the site is diverted to recycle or salvage in compliance with one of the following: Tier 1. At least a 65 percent reduction (Section A4.408.1 Enhanced construction waste reduction).

Environmental Quality

- Indoor Air Quality and Exhaust: Filters with a higher value than MERV 6 are installed on central air or ventilation systems. Pressure drop across the filter shall not exceed 0.1 inches water column (Section A4.506.1 Filters).
- Innovative Concepts and Local Environmental Conditions: The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1 (Section A4.509.1 Innovative concepts and local environmental conditions).

Action	Target/Performance Criteria	GHG Reduction Potential
Develop a group of required improvements that achieves a 15 percent improvement in efficiency. Such improvements can include: ▪ Energy efficiency upgrades (require properties to meet code when sold or transferred). ▪ Use of cool roofs or any roof used to shade or cover parking have a Solar Reflectance Index (SRI) of at least 29. ▪ Require outdoor lighting fixtures to be energy efficient. ▪ Encourage* participation in the California Energy Commission's New Solar Homes Partnership. ▪ Encourage* that new projects or rehabilitations of commercial, office, or industrial development incorporate solar or other renewable energy generation to provide 15 percent or more of the project's energy needs.	Develop required improvements by 2016.	69,555 $MTCO_2eq$
Work with Southern California Edison and the California Public Utilities Commission to develop an incentive program for solar installation on new and retrofitted industrial, commercial, and retail buildings.	Develop incentive program by 2018.	
Responsibility:	Community Development Department	
*The City can also encourage energy efficiency upgrades through marketing, financial incentives, and processing time incentives.		

Objective B: Promote Energy Efficient Design

E-2 Energy- and Resource-Efficient Design

Measure Description: Support projects, programs, policies and regulations to encourage energy and resource efficient practices in site and building design for private and public projects. (P1.12)

Action	Target/Performance Criteria	GHG Reduction Potential
Adopt an Energy Conservation Ordinance to ensure that new residential and commercial buildings implement energy efficient features such as cool roofs, efficient framing techniques, low emissivity windows, energy efficient appliances, and renewable energy systems including the voluntary measures in the 2010 California Green Building Standards Code.	Adopt the energy conservation ordinance by 2016.	23,185
Responsibility:	Community Development Department	

E-3 Energy Efficient Retrofits

Measure Description: Prepare guidance to homeowners on energy efficient retrofits of existing dwellings. (A1.7)

Action	Target/Performance Criteria	GHG Reduction Potential
Update the City's website to include the latest web links to energy efficiency rebates, incentives, and case studies.	Update website by 2014.	Supporting Measure.
Work with Southern California Edison and community organizations to develop energy efficiency outreach programs for homes and businesses. The outreach programs should target such programs as smart grid integration, and incentives for voluntary inefficient appliance replacement.	Develop outreach programs by 2015.	
Planning of future City projects should include cost effective solutions for energy efficiency retrofits.	Develop cost effective solutions by 2015.	
Responsibility:	Engineering Department, Community Development Department	

E-4 Efficient Use of Energy Resources in Residential Development

Measure Description: The City shall encourage housing developers to maximize energy conservation through proactive site, building and building systems design, materials, and equipment. The City's goal is to provide the development community the opportunity to exceed the provisions of Title 24 of the California Building Code. The City shall continue to support energy conservation through encouraging the use of Energy Star-rated appliances, other energy-saving technologies and conservation. To enhance the efficient use of energy resources, the City shall review the potential of offering incentives or other strategies that encourage energy conservation. (3.26)

Action	Target/Performance Criteria	GHG Reduction Potential
Adopt an Energy Conservation Ordinance to ensure that new residential and commercial buildings implement energy efficient features such as cool roofs, efficient framing techniques, low emissivity windows, energy efficient appliances, and renewable energy systems including the voluntary measures in the 2010 California Green Building Standards Code.	Adopt Energy Conservation Ordinance by 2016.	Supporting Measure.
Responsibility:	Engineering Department	

Objective C: Promote Sustainable Development

E-5 Sustainable Regional Revitalization Efforts

Measure Description: Support regional and sub-regional efforts pertaining to community revitalization that are rooted in sustainable development principles. (P11.1)

Action	Target/Performance Criteria	GHG Reduction Potential
Continue to implement the goals and policies within the Fullerton Transportation Center Specific Plan to guide sustainable revitalization and transit oriented development. As identified in the subregional OC SCS, the transit oriented development policies implemented in downtown Fullerton provide a foundation for increasing public transportation service throughout the County.	*Ongoing.*	Supporting Measure.
Responsibility:	Community Development Department, Engineering Department, and City Manager's Office	

3. WATER USE AND EFFICIENCY STRATEGY

Conserve and protect water resources and promote efficiency through public education.

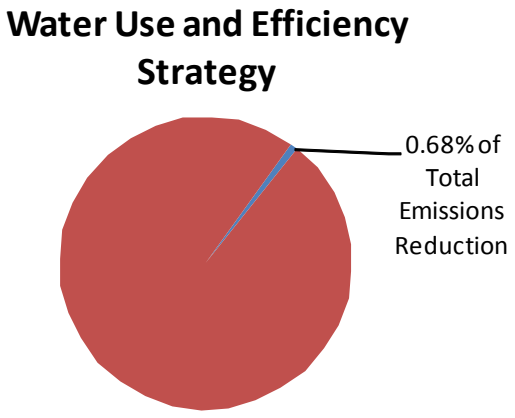
Water related emissions are mostly caused by energy used to pump, transport, heat, cool, and treat water and wastewater. In a dry climate, water demand and resulting emissions are magnified due to a relative shortage of naturally occurring water sources. Therefore, water conservation strategies have a double benefit of reducing energy demand and managing a limited resource. Approximately 43.7 percent of Fullerton's municipal emissions (1.13 percent of the total emissions) are related to water treatment and delivery.

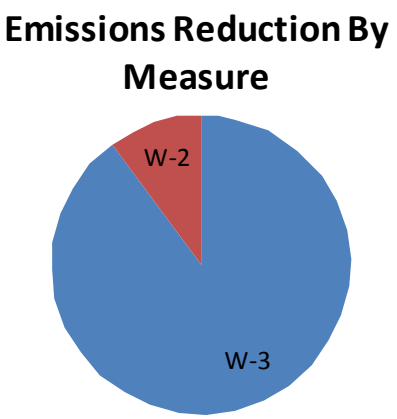
Additionally, movement, storage, and treatment of water and wastewater use significant amounts of energy. Fullerton can reduce municipal water use by installing low-flow fixtures and by inspecting, repairing, and replacing leaking components. Landscaping irrigation measures such as water reclamation systems and xeriscaping can also reduce water usage.

As the water purveyor, the City will work with the Metropolitan Water District of Southern California (MWD), the Municipal Water District of Orange County (MWDOC), and the Orange County Water District (OCWD) to identify community actions that can reduce potable water demand, minimize wastewater generation, explore viable alternative sources of water, manage stormwater runoff, and help to maintain a healthy balance in the local aquatic ecosystem.

WATER USE AND EFFICIENCY REDUCTION MEASURES

Objective:	Conserve Water
W-1:	Conservation Efforts
W-2:	Sustainable Water Practices in New Development
Objective:	**Reduce GHG Emissions from Water**
W-3:	GHG Emissions from Water Conveyance





Total Water Use and Efficiency Strategy Emission Reductions = 4,292 $MTCO_2eq$

Objective A: Conserve Water

W-1 Conservation Efforts

Measure Description: Support regional and subregional efforts to promote water efficiency and conservation. (P19.2)

Action	Target/Performance Criteria	GHG Reduction Potential
Adopt a water conservation strategy for new development that would reduce water consumption consistent with the Tier 1 voluntary standards* in the 2010 California Green Building Standards Code (CALGreen).	Adopt the water conservation strategy by 2015.	Supporting Measure.
Responsibility:	Engineering Department	
*The voluntary standards provided in CALGreen are intended to eventually become mandatory standards in future California Building Code updates.		

W-2 Sustainable Water Practices in New Development

Measure Description: Support projects, programs, policies, and regulations to encourage water efficient practices in site and building design for private and public projects. (P19.7)

Action	Target/Performance Criteria	GHG Reduction Potential
Develop urban water use targets to help meet the 20 percent statewide water reduction goal by 2020 and the interim 10 percent goal by 2015.	Reduce water consumption 10 percent by 2015. Reduce water consumption 20 percent by 2020.	3,860 $MTCO_2eq$
Responsibility:	Engineering Department	

Objective B: Reduce GHG Emissions from Water

W-3 GHG Emissions from Water Conveyance

Measure Description: Support regional and subregional efforts to reduce greenhouse gas emissions associated with water conveyance through water conservation strategies and alternative supply programs. (P22.3)

Action	Target/Performance Criteria	GHG Reduction Potential
Work with the Metropolitan Water District of Southern California (MWD), the Orange County Water District (OCWD), and the Municipal Water District of Orange County (MWDOC) to establish recycled water infrastructure throughout the City.	Expand recycled water infrastructure to supply at least 20 percent of the City's outdoor water demand by 2020.	433 $MTCO_2eq$
Responsibility:	Engineering Department	

4. SOLID WASTE REDUCTION AND RECYCLING STRATEGY

Manage solid waste generation and diversion in order to achieve a zero-waste future.

The largest source of human-generated methane comes from improperly managed landfills. Organic waste that is trapped within a landfill without oxygen decomposes and creates methane gas, a GHG that is 23 times more potent than carbon dioxide.[1] In addition, there are GHG emissions associated with the disposal of foam products and refrigerants. Thus, waste reduction and recycling activities reduce the potential to generate methane at landfills, as well as reducing pollutants generated from transporting waste to disposal sites. Waste reduction and recycling activities also conserve natural resources. Emissions from this portion of the waste stream can be reduced through methane recovery, recovery of potent GHGs from foam and refrigerant systems, and other adjustments to collection systems.

The City of Fullerton currently disposes of 189,203 tons of solid waste per year[2] at 11 landfill sites within the region, and as far away as Simi Valley. The majority of solid waste generated from the City is disposed at the Olinda Alpha Landfill in the City of Brea. The site serves as an integrated waste management facility where a variety of programs such as shredding, mulching, and salvaging are conducted. Several other landfill facilities received nominal amounts of waste flow from Fullerton. Solid waste generated in the City of Fullerton is also transferred to the Commerce Refuse to Energy facility, which converts solid waste into energy. As a result, solid waste diverted to the Commerce Refuse to Energy facility does not contribute to the depletion of landfill space.

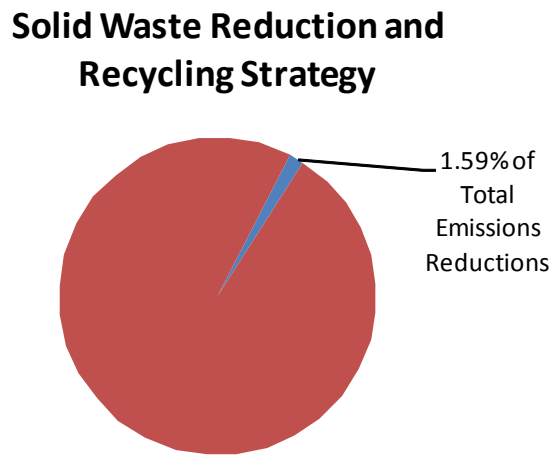
Reducing the amount of waste sent to landfills would reduce transportation costs, landfill tipping fees, and methane gas production. The success of these measures are not only dependent upon the City's actions, but on starting change in the waste management practices of each citizen in the community.

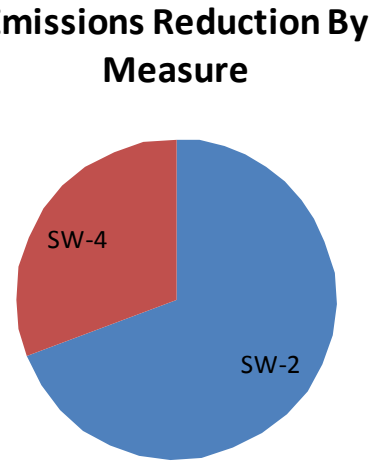
WASTE REDUCTION AND RECYCLING REDUCTION MEASURES

Objective:	**Reduce the amount of waste generated in Fullerton**
SW-1:	Regional Waste Management
Objective:	**Divert materials from Landfill**
SW-2:	Waste Reduction and Diversion
SW-3:	Waste Stream Separation and Recycling
SW-4:	Food-Waste Processing Facility
Objective:	**Reduce GHG Emissions from Solid Waste**
SW-5:	GHG Emissions from Waste

[1] U.S. Environmental Protection Agency, *Greenhouse Gas Equivalencies Calculator*, http://www.epa.gov/cleanenergy/energy-resources/calculator.html.

[2] Based on 2009 baseline data derived from the California Department of Resources Recycling and Recovery (CalRecycle), *Jurisdiction Profile for the City of Fullerton* (http://www.calrecycle.ca.gov/Profiles/Juris), accessed July 22, 2011.





Total Solid Waste Reduction and Recycling Emission Reductions = 9,957 $MTCO_2eq$

Objective A: Reduce the amount of waste generated in Fullerton

SW-1 Regional Waste Management

Measure Description: Support regional and sub-regional efforts on recycling, waste reduction, and product reuse. (P23.1)

Action	Target/Performance Criteria	GHG Reduction Potential
Form a committee for Solid Waste Reduction including staff from the Engineering and Community Development departments. Include any local volunteers to implement the programs within the solid waste strategy of this Climate Action Plan.	Form a Solid Waste Reduction Committee by 2013. Increase the City's solid waste stream diversion rate by 15 percent in 2020 and by 25 percent in 2030.	6,889 $MTCO_2eq$
Continue to make information easily accessible on the City's website regarding waste reduction and recycling.	Ongoing.	Supporting Measure.
Provide the public with outreach materials informing residents and businesses/ institutions about waste reduction and recycling efforts in the City.	Work with the City's solid waste collection contractor to continue to provide information about recycling programs.	Supporting Measure.
Provide the public with outreach materials informing residents and businesses/ institutions about the benefits of using compost in their yards (e.g., soil health, water conservation, plant health).	Work with the City's solid waste collection contractor to develop and distribute information promoting composting.	Supporting Measure.
Responsibility:	Administrative Services and Community Development Departments	

Objective B: Divert Materials from Landfill

SW-2 Waste Reduction and Diversion

Measure Description: Support projects, programs, policies, and regulations to promote practices to reduce the amount of waste disposed in landfills. (P23.3)

Action	Target/Performance Criteria	GHG Reduction Potential
Prepare and implement a strategic plan with the goal of achieving zero waste by 2030.	Adopt a Plan by 2014 and complete full implementation by 2030.	Supporting Measure.
Designate an environmental programs coordinator to implement these programs within the City.	Designate an Environmental Programs manager by the time of the Zero Waste Plan adoption in 2014.	Supporting Measure.
Responsibility:	Administrative Services/Community Development Department	

SW-3 Waste Stream Separation and Recycling

Measure Description: Support projects, programs, policies and regulations to expand source separation and recycling opportunities to all households (including multi-family housing), businesses, and City operations. (P23.4)

Action	Target/Performance Criteria	GHG Reduction Potential
Implement a pay-as-you throw waste program to incentivize reducing waste and increasing diversion. Smaller trash bins cost less than larger bins.	Work with the City's solid waste collection contractor to provide incentives to reduce waste. Take immediate action for full implementation by 2015.	Supporting Measure.
Provide recycling bags (e.g., Multi Bag, Inc.) for residents in multifamily housing for convenient collection of recyclables. http://multibag.com/recycling-bags/	Work with the City's solid waste collection contractor to provide recycling bags to 40 percent of multifamily housing units by 2020 and 100 percent by 2030.	Supporting Measure.
Implement programs within all City operations to reduce waste, reuse items, and increase diversion through recycling (e.g., recycle bins at every desk and less/smaller trash cans; double sided printing, discourage single use plates/cutlery/cups)	Ongoing.	Supporting Measure.
Responsibility:	Administrative Services/Community Development Department	

SW-4 Food-Waste Processing Facility

Measure Description: Explore the feasibility of a food-waste processing facility to serve the City's food-service and food-processing businesses and large institutions. (A23.3)

Action	Target/Performance Criteria	GHG Reduction Potential
Work with local waste haulers/landfills or private businesses to develop a food waste/organics composting program to process organics from restaurants and large organizations (hospitals, schools, etc).	Divert 40 percent of organics from commercial waste stream by 2020. Divert 100 percent of organics from residential waste stream by 2030.	3,068 $MTCO_2eq$
Continue to partner with companies like the City's solid waste collection contractor to host compost give-away events.	Ongoing.	Supporting Measure.
Responsibility:	Administrative Services/Community Development Department	

Objective C: Reduce GHG Emissions from Solid Waste

SW-5 GHG Emissions from Waste

Measure Description: Support projects, programs, policies, and regulations to reduce greenhouse gas emissions from waste through improved management of waste handling and reductions in waste generation. (P22.6)

Action	Target/Performance Criteria	GHG Reduction Potential
Streamline waste collections to be able to send more loads to a materials recovery facility (MRF) (e.g., create collection routes that can collect from offices, institutions)	Ongoing.	Supporting Measure.
Ensure the use of green trucks for waste collection by phasing out older trucks.	Ensure that future contracts with solid waste haulers require the use of alternatively fueled collection trucks.	Supporting Measure.
Work with local businesses to reduce packaging.	Ongoing.	Supporting Measure.
Responsibility:	Administrative Services/Community Development Department	

ADDITIONAL EMISSIONS REDUCTIONS FROM STATEWIDE LEGISLATION

Implementation of the recommended measures and actions will result in a potential reduction in GHG emissions of up to 289,016 $MTCO_2eq$. As a result, the City of Fullerton would not achieve the emission reduction target of 15 percent below 2009 emission levels with these measures alone. Therefore, the community will assume credit for a portion of the GHG emission reductions that will occur through legislation being implemented at the state-wide level.

The State of California has established companion legislation that will reduce statewide generation of GHG emissions across all emissions sectors in order to implement AB 32. Senate Bill 107 (SB 107) establishes performance standards for GHG emission reductions from electric utilities. Assembly Bill 1493 (AB 1493) establishes performance standards for GHG emission reductions from motor vehicles. Executive Order S-1-07 (EO S-1-07) and EO S-1-09 establishes performance standards for the carbon intensity of transportation fuels. At the time of CAP preparation, the City only has confidence in estimating the GHG emission reductions associated with SB 107, AB 1493, and EO S-1-07. As the regulatory framework surrounding AB 32 grows in the future, it may be possible to evaluate a wider range of statewide reductions.

Senate Bill 1078, Senate Bill 107, and Senate Bill X1-2

California utilities must meet increasingly stringent renewable energy requirements set by SB 1078 and SB 107. SB 1078 required investor-owned utilities to provide at least 20 percent of their electricity from renewable resources by 2020. SB 107 accelerated the timeframe by ten years to take effect in 2010. Sources of renewable energy include wind, solar, geothermal, or any Renewable Portfolio Standard (RPS) eligible sources.

Southern California Edison (SCE), Fullerton's electricity provider, delivered 19 percent of its electricity from renewable sources in 2010, and has contracts in place to deliver 20 percent by 2020 as required by law.[3] At a minimum, this performance criterion would also be in effect at the CAP target year (2020) as well as The Fullerton Plan buildout year. Additionally, EO S-14-08 would increase the RPS further to 33 percent by 2020. In response to EO S-14-08, CARB adopted the "Renewable Electricity Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers. On April 12, 2011, Governor Jerry Brown reinforced the requirements of Executive Order S-21-09, and signed SB X1-2 requiring California's electric utilities to procure 33 percent of their energy from renewable resources by 2020.

Table 3-1, *Electricity Emission Reductions from State Legislation*, provides the estimated emissions reduction effect of SB 107, SB X1-2, EO S-14-08, and EO S-21-09 on Fullerton's 2020 and 2030 GHG emissions.

[3] Southern California Edison, *Renewable Energy*, *2010 Renewables Summary,* http://www.sce.com//PowerandEnvironment/Renewables/default.htm, accessed August 10, 2011.

Table 3-1
Electricity Emissions Reductions from State Legislation

Emissions Sector	Building Energy Emissions				
	BAU (16 Percent Renewable) ($MTCO_2eq$/year)			33 Percent Renewable ($MTCO_2eq$/year)	
	2009	2020	2030	2020	2030
Residential	112,866	125,969	137,881	104,555	114,441
Commercial	101,169	129,334	154,938	107,347	128,599
Industrial	42,564	45,238	47,669	37,548	39,565
Municipal	40,352	43,461	46,288	36,073	38,419
Total	*296,951*	*300,541*	*340,488*	*285,522*	*321,024*

BAU = business as usual; RPS = renewable portfolio standard; $MTCO_2eq$/year = metric tons of carbon dioxide equivalent

Source: ICLEI Clean Air and Climate Protection Software.

Assembly Bill 1493

GHG emissions will be reduced from on-road passenger motor vehicles sold in California with the implementation of Assembly Bill 1493 (AB 1493). The emission reduction potential associated with implementation of the vehicle emission standards would vary depending on the first regulated model year and vehicle turnover between the present fleet and the fleet in 2020 and 2030.

To provide an estimate of the reasonably foreseeable GHG emission reduction potential of motor vehicle emission regulations, the GHG emission reductions associated with AB 1493 were estimated using the California Air Resources Board (CARB) Pavley + Low Carbon Fuel Standard Postprocessor software (Version 1.0)[4]. It is expected that implementation of AB 1493 would reduce on-road mobile-source GHG emissions by approximately 25 percent by 2020 and approximately 33 percent by 2030[5]. Emissions were modeled with the CARB Low Carbon Fuel Postprocessor which is a tool developed for Metropolitan Planning Agencies (MPOs) for estimating the GHG reductions from local land use strategies (SB 375) combined with California vehicle standards (Pavley clean-car standards, 2007) and fuel standards (Low Carbon Fuel Standard (LCFS), 2009). Table 3-2, *Transportation Emissions Reductions from State Legislation*, shows the estimated GHG emission reduction potential of AB 1493 in Fullerton.

Executive Order S-1-07

Under Executive Order S-1-07 (EO S-1-07), ARB has developed a Low Carbon Fuel Standard (LCFS) to reduce the carbon intensity of transportation fuels in California's by at least ten percent by 2020. The development of a diverse set of clean, low-carbon transportation fuel options to reduce GHG emissions is incentivized by the LCFS which is a performance standard

[4] California Air Resources Board, Pavley I and Low Carbon Fuel Standard Post Processor Version 1.0, 2010. http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm,

[5] The reduction number for implementation is based on the CARB Low Carbon Fuel Postprocessor.

with flexible compliance mechanisms. Table 3-2, also includes the estimated GHG emission reduction potential of EO S-1-07 on Fullerton's 2020 and 2030 GHG emissions.

Table 3-2
Transportation Emissions Reductions from State Legislation

Year	Fullerton Transportation Sector Emissions	GHG Emissions Reductions ($MTCO_2eq$/year)	GHG Emissions After Reductions ($MTCO_2eq$/year)	Percent Change[1]
2020	1,162,553	290,638	871,915	25%
2030	1,188,615	392,243	796,372	33%

GHG = Greenhouse Gas; $MTCO_2eq$/year = metric tons of carbon dioxide equivalent per year

Notes:
1. Transportation emissions reductions in this instance are based on an EMFAC2007 model run and were not calculated using the ICLEI CACP software. As a result, transportation emissions may not match the results from the CACP software presented in the emissions inventory. Emissions provided in this table have been included to depict the percent emissions reductions achieved in Fullerton due to the implementation of the Pavley standards.

Source: California Air Resources Board, *Pavley I and Low Carbon Fuel Standard Postprocessor Software (Version 1.0)*, April 2010, California Air Resources Board, *EMFAC2007*, November 2006, and VMT data for the City of Fullerton provided by Kimley-Horn and Associates.

STATEWIDE REDUCTIONS IN RELATION TO THE CAP

The emission reductions shown above in Table 3-1 and Table 3-2 represent the upper bound of the potential emission reductions associated with SB 107 and AB 1493. Similar to the method used to quantify the City's CAP measures, the statewide emissions reduction estimates assume that no other emission reduction activities would occur. In reality, implementation of the City's CAP measures and the State regulations could occur, simultaneously or one preceding another. Thus, GHG reductions from emissions sectors affected by both City CAP measures and State regulations would not have a purely additive effect.

Rather, emission reductions achieved by one (i.e., CAP measures or State regulations) would reduce the capacity of the other to reduce emissions. For example, if SB 107 reduces electricity consumption-related emissions by 6 percent then the potential for additional GHG reduction by the City's electricity conservation-related CAP measures would be reduced. Conversely if the City's CAP measures reduce the quantity of electricity consumption-related GHG emissions the overall effectiveness of SB 107 is reduced.

The timing and synergistic effect of the State regulations in relation to the City's CAP measures are uncertain. Nonetheless, because the focus of the CAP is on actions the City can take to reduce community-wide GHG emissions, the emission reductions achieved by the City's actions were determined first and independent of Statewide reductions.

SUMMARY OF RESULTS

Table 3-3, *Summary of GHG Reduction Measures,* summarizes the GHG reductions anticipated by implementing the quantified measures recommended in the CAP, and provides subtotals for

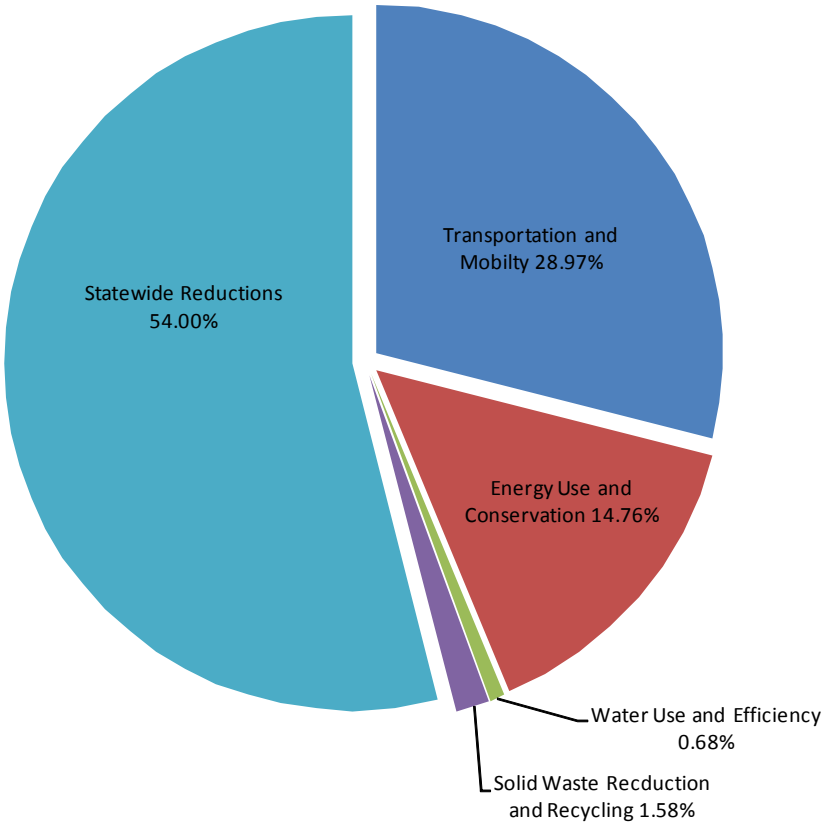
each strategy. This level of GHG reduction can only be realized if the targets and performance criteria are achieved throughout the course of implementing the CAP.

Table 3-3
Summary of GHG Reduction Measure Performance

Number	Strategy and Measure	2020 GHG Reductions ($MTCO_2eq$ per Year) or Supporting Measure	Percent Reduction
Transportation and Mobility Strategy			
T-1	Reduction of Single Occupant Vehicle Trips	110,623	17.61%
T-2	Inter-Jurisdiction Connection	6,987	1.11%
T-3	Bicycle Transportation Plan	29,111	4.63%
T-4	Bicycle Use on All Streets	Supporting Measure	N/A
T-5	Bicycle Safety and Convenience	Supporting Measure	N/A
T-6	Circulation Between Cities	23,289	3.71%
T-7	Infrastructure for Low and Zero Emission Vehicles	3,297	0.52%
T-8	Rail and Rapid Transit	1,744	0.28%
T-9	Car Sharing Pilot Program	6,975	1.11%
	Subtotal	**182,026**	**28.97%**
Energy Use and Conservation Strategy			
E-1	GHG Emissions from Electrical Generation	69,555	11.07%
E-2	Energy- and Resource-Efficient Design	23,185	3.69
E-3	Energy Efficient Retrofits	Supporting Measure	N/A
E-4	Efficient Use of Energy Resources in Residential Development	Supporting Measure	N/A
E-5	Sustainable Regional Revitalization Efforts	Supporting Measure	N/A
	Subtotal	**92,740**	**14.76%**
Water Use and Efficiency Strategy			
W-1	Conservation Efforts	Supporting Measure	N/A
W-2	Sustainable Water Practices in New Development	3,860	0.61%
W-3	GHG Emissions from Water Conveyance	433	0.07%
	Subtotal	**4,292**	**0.68%**
Solid Waste Reduction and Recycling Strategy			
SW-1	the Efforts of Regional Waste Management	Supporting Measure	N/A
SW-2	Waste Reduction and Diversion	6,889	1.10%
SW-3	Waste Stream Separation and Recycling	Supporting Measure	N/A
SW-4	Food-Waste Processing Facility	3,068	0.49%
SW-5	GHG Emissions from Waste	Supporting Measure	N/A
	Subtotal	**9,957**	**1.58%**
	Total Strategy Reductions	**289,016**	**46.00%**
Statewide Reductions			
	AB 1493 and EO S-1-07	291,114	46.33%
	SB 1078 and SB 107	48,160	7.67%
	Subtotal Statewide Reductions	339,274	**54.00%**
	Grand Total	***628,290***	***100%***

The GHG reduction strategies, measures, and actions were based on the Goals and Policies in The Fullerton Plan and were designed to include performance criteria that would allow the City to achieve its GHG reduction target of 15 percent below 2009 levels by 2020. As proposed, the CAP meets this target, with a projected 29.03 percent reduction. The CAP includes other supporting measures that contribute to the GHG emission reductions of other related measures. Other measures could not be quantified, due either to a lack of substantial evidence or limitations inherent in quantifying the effect of less tangible programs and policies. For the CAP to successfully guide Fullerton toward meeting its GHG reduction target, the City must play a prominent role in implementing the CAP's programs and policies. The public also has a role by participating in and ensuring success of the measures and actions.

Potentail GHG Emissions Reductions from 2020 Business As Usual Scenario


Transportation and Mobilty 28.97%
Energy Use and Conservation 14.76%
Water Use and Efficiency 0.68%
Solid Waste Recduction and Recycling 1.58%
Statewide Reductions 54.00%

Fullerton emissions reductions from the 2020 BAU scenario would be 628,290 $MTCO_2eq$, thereby reducing 2020 emissions from a projected 1,875,460 $MTCO_2eq$ to 1,247,170 $MTCO_2eq$.

Chapter 4.0

Implementation

CHAPTER 4.0
IMPLEMENTATION

APPROACH

The Climate Action Plan (CAP) strategies for reducing GHG emissions and adapting to climate change are described only at a schematic level of detail in Chapter 3, *Climate Action Strategies*. While this level of detail is sufficient for some strategies, others will require an additional, more in-depth round of planning prior to implementation. In this later round of planning, strategies will be described in more detail, including specific priorities for implementation, costs, funding sources, and staffing. A major concern with implementing the CAP is limitations on funding and staffing. Due to the current state of the economy, it is essential to focus the CAP on affordable solutions while implementing strategies that will move the City closer to the GHG reduction goal of the CAP. By taking a realistic approach and setting achievable goals, the City will increase its chances of implementing a successful plan and demonstrating tangible progress in the future.

Public education is by far the most powerful and affordable tool to overcome this hurdle. In addition to the programs and policies the City has already put in place or is in the process of developing under the General Plan update, strategies may include incorporating relevant information and ideas in existing publications and events, such as the City's website. The schools can be a powerful instrument for change, and working with schools on climate change education programs is considered an essential strategy. Additionally, much can be accomplished by supporting community groups interested in promoting and implementing the CAP.

The CAP provides a framework to begin the community's transition to a low-carbon future. It provides a critical foundation for action, but it is only a first step. Moving forward, the City will need to take specific steps to advance and monitor the CAP's implementation. These include:

1. ***Assign Responsibility.*** Designate a CAP management team or sustainability coordinator to implement the CAP and associated measures. Resources (such as funding and staff) should also assist with implementing and ensuring that climate change-related considerations are included as requirements in all relevant decision making processes (e.g., the entitlement process). It is critical that the City clearly assign responsibility for the City's carbon budget and implementation of the CAP roadmap to achieve the goals for 2020. Training and support will be required to ensure city staff has the necessary skills and expertise to understand and manage emissions within and between sectors to support a break from business-as-usual for municipal and community-wide practices. Now that the City is a member of ICLEI, this can be accomplished through their Climate Resiliency process.

2. ***Study the Costs and benefits of the CAP Implementation.*** Conduct a formal cost estimation study for the most effective emission reduction strategies identified in the CAP.

3. ***Develop and Implement a Performance Monitoring Process.*** To ensure the community stays on course to meet GHG reduction targets, it is ultimately necessary to track progress by conducting regular inventories and monitoring procedures. This should be done on an annual basis, with the results presented to the City Council.

4. ***Communication and Collaboration.*** Work with energy utilities to create durable and interoperable exchanges of city-wide energy performance data. The City should also partners with local, regional, and state agencies to ensure collaboration and achieve future reduction goals.

During the implementation and monitoring process the CAP will be reviewed to evaluate improvements to climate science, explore new opportunities for GHG reduction and climate adaptation, and respond to changes in climate policy. The California Natural Resources Agency and the California Energy Commission have developed a web-based climate adaptation tool called Cal-Adapt (http://cal-adapt.org/). The City can utilize the Cal-Adapt tool to identify potential climate change risks in specific areas. Cal-Adapt combines volumes of climate change research and presents it in a visually graphic, accessible, and intuitive format intended to benefit local planning efforts as well as inform California citizens of potential climate change impacts. This tool fulfills recommendations made in the *California Climate Adaptation Strategy* to provide planners with detailed information regarding potential sea-level rise, wildfire dangers, temperature changes, and fluctuations in snowpack in specific areas, which will help inform how to respond to those impacts.

REGIONAL COORDINATION

The CAP implements policies that have been identified in the Built Environment and Natural Environment Master Elements, including the Mobility, Bicycle, Water, Air Quality and Climate Change, and Integrated Waste Management Chapters of The Fullerton Plan. The Fullerton Plan includes specific goals and policies that guide the City's approach to climate change, including emissions reductions targets, guidelines for preparing inventories or plans, and general reduction strategies. As climate change is a cross-cutting issue addressed by many elements of The Fullerton Plan, the CAP as a whole is considered an implementation measure for the policies described in this CAP. This structure allows the City to update the CAP on an on-going, as-needed basis to ensure that the City's climate protection efforts reflect both current legislation and emerging best practices.

SB 375 enhances California's ability to reach its AB 32 goals by promoting good planning with the goal of more sustainable communities. SB 375 requires CARB to develop regional GHG emission reduction targets for passenger vehicles. CARB is to establish targets for 2020 and 2035 for each region covered by one of the State's 18 metropolitan planning organizations (MPOs). Each of California's MPOs then prepare a "sustainable communities strategy (SCS)" that demonstrates how the region will meet its GHG reduction target through integrated land use, housing and transportation planning. Once adopted by the MPO, the SCS will be incorporated into that region's federally enforceable regional transportation plan (RTP). CARB is also required to review each final SCS to determine whether it would, if implemented, achieve the GHG emission reduction target for its region. SB 375 also establishes incentives to encourage implementation of the SCS. Developers can get relief from certain environmental review requirements under the California Environmental Quality Act (CEQA) if their new

residential and mixed-use projects are consistent with a region's SCS that meets the target (California Public Resources Code Sections 21155, 21155.1, 21155.2, 21159.28.).

On September 23, 2010, CARB adopted Resolution 10-31, establishing SB 375 regional targets for all Metropolitan Planning Organizations (MPOs) in California. The Southern California Association of Governments (SCAG) is the MPO encompassing the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. The SB 375 target set for the SCAG is a 13 percent reduction in GHG emissions from automobiles and light duty truck exhaust by 2035 (compared to SCAG's recommended target of 8 percent). SCAG is responsible for developing the Sustainable Communities Strategy (SCS) for the SCAG Region.

In the SCAG region, SB 375 also allows for a subregional council of governments and county transportation commission to work together to propose a subregional SCS. As one of these subregions, Orange County has prepared its own subregional SCS (OC SCS), which will be incorporated into the SCAG Regional SCS.

Created by a joint committee of representatives from the Orange County Council of Governments (OCCOG) and the Orange County Transportation Authority (OCTA), the OC SCS identifies various sustainability strategies to reduce GHG emissions. The sustainability strategies outlined in the OC SCS include both land use-related strategies and transportation system improvements. Implementation of the strategies within the OC SCS requires coordination with the cities within Orange County, including the City of Fullerton.

The OC SCS identifies major growth in employment is projected to occur near Fullerton, Buena Park, Tustin, and around the Irvine Spectrum and the Anaheim Canyon, all near Metrolink stations. Additionally, Fullerton includes some of the most areas of housing units within the County. This CAP incorporates the goals and policies of The Fullerton Plan, which has been developed to address future growth and development within the City.

Transit Network Improvements

The OC SCS also identifies transportation and land use opportunities that would enhance mobility and connect Fullerton to other areas of the county, thereby reducing vehicle trips. The OC SCS envisions enhancements to the Metrolink commuter rail network as well as the establishment of bus rapid transit (BRT) line along Harbor Boulevard that would connect Fullerton with Costa Mesa. CAP Measure T-6 and T-8 emphasize coordination with OCTA to implement the transit improvements planned in the OC SCS. These measures include coordination with the following programs:

- ***Metrolink Service Expansion Program (MSEP).*** The MSEP involves the addition of more frequent commuter rail service between Fullerton and Laguna Niguel, and the necessary station and infrastructure improvements to accommodate this service.

- ***Expansion of parking facilities at the Fullerton Metrolink Station.*** Additional parking and improved amenities will encourage additional ridership from more frequent service.

- ***Harbor Boulevard BRT Line.*** The Harbor Boulevard BRT line is a 19-mile fixed route that would connect Fullerton with Costa Mesa.

- ***Orange County Measure M2.*** The M2 Go Local Program is a Capital Action Plan of transportation improvements to provide mobility choices and sustainable transportation options within Orange County dress increases in demand induced by the rail improvements through development of feeder services between rail stations and key destinations. Through M2, OCTA's goal is to extend the enhanced Metrolink service levels to Union Station in Los Angeles.

Additionally, OCTA is coordinating with the State on the California High Speed Rail project. To support these future rail services, regional gateway station improvements such as the Anaheim Regional Transportation Intermodal Center (ARTIC) are underway. These efforts will strengthen the backbone of Orange County's transit system and will facilitate the reduction of single occupant vehicle trips in Fullerton.

BICYCLE MASTER PLAN

The *Fullerton Bicycle Master Plan* serves as a guiding document for the development and maintenance of a bikeways network that is safe, efficient, and comfortable, and that facilitates transportation as well as recreation. As a component of The Fullerton Plan, the proposed *Fullerton Bicycle Master Plan* has been prepared in accordance with requirements for a Bicycle Transportation Plan (BTP) (Section 891.2[a] through [k] of the Streets and Highways Code) and establishes the City of Fullerton's eligibility for Caltrans Bicycle Transportation Account (BTA) funds. The *Fullerton Bicycle Master Plan* sets forth a program for enhancements, improvements, and additions to the City's bikeways network to ensure that it meets the needs of users, now and in the future.

Implementation of The Fullerton Plan and the *Fullerton Bicycle Master Plan* would improve and support the City's bikeways network, providing additional opportunities for people to move through and around the City. Policies and actions support bicycle infrastructure and connectivity throughout the City and surrounding region and encourage programs and policies that make bicycling safer and more convenient for all types of bicyclists. Objective B, Measure T-3 through T-5 within this CAP would facilitate the implementation of the *Fullerton Bicycle Master Plan* to reduce City-wide GHG emissions. Additionally, Appendix E of the *Fullerton Bicycle Master Plan* provides an inventory of potential funding sources for improvement projects associated with the plan.

LAND USE

The Fullerton Plan identifies twelve Focus Areas that present opportunities where land use and design change can help fully implement the Fullerton Vision. Further planning for the Focus Areas can catalyze revitalization efforts along corridors; create more options for travel between Fullerton's major destinations and neighborhoods; guide the enhancement of unique assets such as Downtown, the Transportation Center, California State University (CSU) Fullerton, West Coyote Hills, and the Airport; and support the function of business clusters such as medical facilities and industrial areas.

Buildout of The Fullerton Plan assumes that the proposed land use intensity for the Focus Areas are realized. With regard to trip-generating potential, one characteristic of multi-use developments is the potential for beneficial interactions among site uses in terms of walk/bike trips or shared vehicular trips between land uses. These interactions represent the potential for a reduction in the number of new trips assumed for the new development.

For example, residents of proposed residential developments may also patronize the proposed new commercial development. Vehicular trips between the residential and commercial zones could be contained within the project area, and would not contribute to traffic growth at off-site intersections. Walking and biking trips between uses would represent elimination of a vehicular trip altogether. Shuttle activity between educational institutions and the commercial centers would further reduce vehicular trips. This potential for reduction in vehicular trips is known as internal capture and mode shift. As a result of these factors, the total inbound and outbound vehicular trips for the project may be reduced. Varying internal capture and mode shift factors were applied to the different Focus Areas, depending on the mix, proximity, and quantity of complementary uses proposed. Therefore, implementation of The Fullerton Plan would inherently reduce vehicle trips and contribute to a reduction of the City's GHG emissions.

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Chapter 5.0

Public Participation

CHAPTER 5.0
PUBLIC PARTICIPATION

Fullerton residents have played an important role in the formulation of this Climate Action Plan (CAP) through The Fullerton Plan community workshops. Community members have provided their input and have stressed several points of change they would like to see in their City. Community support is vital to the success of this CAP and community members will need to take an active role in implementing the CAP and monitoring its success over time.

COMMUNITY OUTREACH THROUGH WORKSHOPS AND SURVEYS

A variety of outreach tools allowed residents who wished to participate to do so in a manner with which they felt comfortable. Outreach efforts included "focused future" visioning charrettes (six meetings), youth visioning workshops (4 meetings), visioning open house, and an ongoing online survey. Updates were shared with the public through roadshow presentations (presentations to Chamber of Commerce, the Fullerton Collaborative, the Transportation and Circulation Commission, the Parks and Recreation Commission, and the Rotary Club), the virtual Fullerton Community Open House, and the General Plan Educational Program Series (2 meetings). The community workshops included presentations, surveys, group activities, and comments. Information about The Fullerton Plan was available on the City's website to provide the public with information on past and upcoming events, as well as links to documents and reports.

The City conducted these community visioning workshops and educational programs in 2007. Community members participated in small group discussion and presentation sessions, the 'Treasures, Challenges, and Visions' Post-it Note exercise, group City Vision statements, surveys, and open discussions. Information gathered from these meetings and surveys was used to formulate goals and policies, as well as the strategies, goals, measures, and actions in this CAP. Through the workshops and surveys, community members have provided valuable input that has been used to select GHG reduction measures.

"Focused Future" Visioning Charrettes

Six visioning charrettes were held between June and August of 2007. Approximately 105 community members attended one or more of these workshops to share their ideas about the future of their city. During these charrettes, participants were asked to identify Fullerton's treasures and challenges, as well as their visions for the future of the city. These ideas were written on Post-it Notes and placed on the walls for all of the participants to see. Then, the community members worked in groups to write vision statements for the city. The Post-it Note comments and the vision statements from the six visioning charrettes are listed by theme in Appendix J of The Fullerton Plan.

Youth Visioning Workshops

Four youth visioning workshops were held during the summer of 2007. Participants in the first youth workshop were high school students from the Fullerton Library Teen Advisory Committee. The second workshop was conducted with youth ages 12 through 15 from the City's Teen Scene program. Participants in the third and fourth workshops were from the Boys' and Girls' Club. The third workshop was designed for youth ages 11 to 13 and the fourth was designed for youth ages 14 to 17. At each of the youth visioning workshops, participants identified the treasures and challenges in Fullerton, as well as their visions for the future of the city. After that exercise, the youth drafted vision statements and illustrated their ideas. Refer to Appendix J of The Fullerton Plan for the comments, vision statements and illustrations from the youth workshops.

Visioning Open House

In August of 2007, a Visioning Open House was held to show the community the results of the Visioning Charrettes and to receive further input from the community. Approximately 35 community members attended. For community comments from the Visioning Open House, refer to Appendix J of The Fullerton Plan.

Online Survey

An ongoing online survey is accessible from the General Plan Update website. The survey will garner input from those who were unable to attend the Visioning Workshop and Open House. It asks participants to list Fullerton's treasures and challenges, and their visions for the future.

Roadshow Presentations

Presentations were made to a number of community groups and organizations including the Chamber of Commerce, the Fullerton Collaborative, the Transportation and Circulation Commission, the Parks and Recreation Commission, and the Rotary Club.

Virtual Fullerton Community Open House

Approximately 30 Fullerton community members attended an interactive Community Open House on May 21, 2007.

General Plan Educational Program Series

In April of 2007, two community meetings were held to acquaint community members with the General Plan Update. Approximately 25 people attended one or both of the meetings.

KEY FINDINGS FROM COMMUNITY THEMES

Comments from the workshops, survey, open house, and other outreach efforts were compiled and reviewed to determine the common themes throughout the community. Nine community themes were identified in Fullerton:

- Open Space, Parks and Sustainability
- Sense of Community and Community Character
- Economic Development and Vitality
- Cultural Resources and Community Activities
- Community Services
- Community Health and Safety
- Community Design
- Mobility
- Growth Management and Density

Open Space, Parks, and Sustainability. Residents would like to see the treasured open spaces and parks of Fullerton preserved and enhanced. In addition community members also expressed a desire to adopt sustainable practices including "green" building practices throughout the city. Environmental challenges, such as impacts on air and water quality and global warming, were listed and visions for more sustainable development were heard.

Sense of Community and Community Character. Community members identified Fullerton's "small-town feel" and strong sense of community as treasures. However, maintaining these treasures as the city continues to grow and change is a challenge. As part of enhancing the sense of community, residents envision increased communication with the city leaders and more community involvement. Visioning participants recognized and valued the diverse population within the city, however many would also like to see stronger connections between the different groups of residents and neighborhoods. As Fullerton's population continues to become more diverse, the participants expressed a desire to create a cohesive community with a distinct identity reflective of the entire city.

Economic Development and Vitality. Community members listed many of the small and independent businesses as treasures within the city. In the future, they would like to see these types of businesses retained, but would also like to see the city welcome new businesses in order to create a strong economic base in the city. Many of the participants would like to see more "family-friendly" activities in the Downtown. Ideas for the future include creating a more pedestrian-friendly Downtown that is a destination place, attracting visitors as well as residents. When asked why they moved to Fullerton, many residents said access to jobs was important and the location of Fullerton made the city desirable. However, housing options and opportunities were seen as a large challenge. Creating and maintain affordable and workforce housing were seen as challenges. Lack of housing opportunities is seen as a barrier to attracting those just entering the workforce.

Cultural Resources and Community Activities. The educational resources including the public school system, the colleges and universities, and the libraries were listed as treasures by many of the visioning participants. The community takes pride in the strength of the educational resources in Fullerton, but would like to ensure they are accessible to all segments of the

population. Many residents treasure the arts and cultural resources including the museums and theaters in Fullerton.

Comments from the visioning charrettes show that the community values these resources as an integral part of the city's identity. Participants' visions for the future include continued support for the cultural resources and increased attraction of visitors. Community activities and organizations, including the Farmer's Market, the community newspaper and activities for children, are treasured by Fullerton's residents. In the future, residents would like to see more community gathering spaces as well as activities for all ages. Specifically, more activities for children and teens, as well as for young families, were suggested.

Downtown Fullerton is a hub of activities that the community sees as both a treasure and a challenge. Access to Downtown and its historic architecture and sense of place are valued. However, residents would like to see a larger variety of businesses and activities that attract all ages at various times of the day.

Community Services. Some of the participants in the visioning process said they were happy with the current quality of the services in the city. However, many were concerned about the cost of providing services in the future, as well as maintaining and repairing the City's infrastructure. Challenges include maintaining the streets and sewer system as well as funding services such as fire protection, law enforcement and social services. Providing accessible and equitable services for all parts of the city was a concern as well. The residents of Fullerton would like to see the recycling program expanded.

Community Health and Safety. Some participants commented they feel safe in Fullerton while others saw increased crime as an existing and future challenge. Specific areas the participants would like to focus on include gang activity and threats to safety in the Downtown. Again, funding for equitable and adequate services was identified as a challenge to overcome. The medical services in the city, especially St. Jude Medical Center are treasured, as well as the cleanliness of the city. Homelessness is seen as a challenge for the community to work on. Increased upkeep of the public spaces and facilities in the city are also envisioned for the future.

Community Design. Fullerton has many historic neighborhoods and buildings that were cited as treasures by the visioning participants. These historic resources help create the "charm" of Fullerton. Many Fullerton residents also treasure the "semi-rural" feel of portions of the city and would like it maintained. Moving into the future, the residents would also like to see the character of the city maintained through the physical design. Besides maintaining the historic and rural feel that Fullerton has, many community members wish to enhance the aesthetics of the city through stronger design standards for new developments and proactive neighborhood preservation.

Mobility. Residents of Fullerton treasure their current transportation options including the train, bus lines, and bicycle and pedestrian system; yet they would like to see these options enhanced through increased public transportation and improved bicycle routes. The community would like to see the challenge of traffic congestion overcome. Residents envision pedestrian-only streets in the downtown, additional bike paths and parking, and increased public transit within the City. Included in the theme of mobility is active living. Participants expressed a desire for a healthy community with areas for walking, bicycling and recreation as part of the daily routine.

Growth Management and Density. Concerns about the growing population in Fullerton leading to unbalanced growth or overcrowding were heard throughout the visioning charrettes. In keeping with the small-town feel in Fullerton, community members would like to see new buildings that are appropriately in scaled to their surroundings. Increasing density in various parts of the city was also a concern and many participants indicated they would like to see a well-planned, well thought out community as Fullerton moves forward.

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Chapter 6.0

References

CHAPTER 6.0
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Appendices

Appendix A

GHG Emissions Data

ICLEI Clean Air Climate Protection (CACP) Software (Version 2.2.1b) Input Summary

City of Fullerton

Year 2009 Baseline

COMMUNITY

	Electricity (kWh)	Natural Gas (thousand cu ft)
Residential		
Commercial Residential	4,180,490	35,767
Multi-Family	110,538,219	945,719
Single Family	143,802,087	2,044,129
Commercial		
College/University	60,978,876	298,361
Commercial Retail	132,482,895	506,579
Elementary School	2,807,087	13,735
High School	2,807,087	13,735
Office	26,448,377	49,958
Other	6,205,203	30,359
Industrial		
General Light Industrial	97,492,483	1,344,724

Waste	Tons
Commercial	139,106
Paper	34.9%
Food Waste	14.6%
Plant Debris	14.6%
Wood or Textiles	0.0%
Other	35.9%
Residential	50,097
Paper	27.5%
Food Waste	22.5%
Plant Debris	22.5%
Wood or Textiles	0.0%
Other	27.5%

Transportation	
Total VMT	1,987,022,162
Heavy Duty Vehicles (diesel):	47,688,532
Light Trucks (gasoline):	858,393,574
Passenger Cars (gasoline):	1,080,940,056

MUNICIPAL

Energy Usage	Electricity	Natural Gas
Municipal Buildings	13,995,200 kWh	80,131 therms (data from city)
Streetlights and Traffic Signals	21,705,903 MWh	N/A
Airport	2,889,915 kWh	16,514 thousand cu ft
Water Delivery Facilities (import)	40,484,688 kWh	N/A
Water Well Pumps (local)	5,043,716 kWh	N/A

Municipal Vehicle Fleet	Vehicle Miles
Heavy Duty Vehicles (diesel)	124,684
Passenger Cars (gasoline)	2,368,984
Employee Commute	
Passenger Cars (gasoline)	5,449,600

Community Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	(%)	Energy (MMBtu)
Residential						
Fullerton, California						
Commercial Residential						
Electricity	2,003	46	121	2,012	0.1	14,268
Natural Gas	2,153	8	406	2,158	0.1	36,804
Subtotal Commercial Residenti	4,156	54	527	4,170	0.2	51,072
Multi-Family						
Electricity	52,975	1,216	3,206	53,197	2.8	377,264
Natural Gas	56,918	215	10,727	57,064	3.0	973,145
Subtotal Multi-Family	109,893	1,430	13,933	110,261	5.8	1,350,408
Single Family						
Electricity	68,916	1,582	4,170	69,205	3.7	490,792
Natural Gas	123,026	464	23,186	123,341	6.5	2,103,409
Subtotal Single Family	191,942	2,046	27,356	192,546	10.2	2,594,201
Subtotal Residential	305,991	3,530	41,816	306,977	16.3	3,995,681
Commercial						
Fullerton, California						
College/University						
Electricity	29,224	671	1,768	29,346	1.6	208,119
Natural Gas	17,957	68	3,384	18,003	1.0	307,013
Subtotal College/University	47,181	738	5,153	47,349	2.5	515,132
Commercial/Retail						
Electricity	63,492	1,457	3,842	63,758	3.4	452,160
Natural Gas	30,488	115	5,746	30,567	1.6	521,270
Subtotal Commercial/Retail	93,980	1,572	9,588	94,324	5.0	973,430

Community Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Elementary School						
Electricity	1,345	31	81	1,351	0.1	9,581
Natural Gas	827	3	156	829	0.0	14,133
Subtotal Elementary School	2,172	34	237	2,180	0.1	23,714
High School						
Electricity	1,345	31	81	1,351	0.1	9,581
Natural Gas	827	3	156	829	0.0	14,133
Subtotal High School	2,172	34	237	2,180	0.1	23,714
Office						
Electricity	12,675	291	767	12,728	0.7	90,267
Natural Gas	3,007	11	567	3,014	0.2	51,407
Subtotal Office	15,682	302	1,334	15,743	0.8	141,674
Other						
Electricity	2,974	68	180	2,986	0.2	21,178
Natural Gas	1,827	7	344	1,832	0.1	31,239
Subtotal Other	4,801	75	524	4,818	0.3	52,418
Subtotal Commercial	165,988	2,756	17,073	166,594	8.8	1,730,082
Industrial						
Fullerton, California						
General Light Industrial						
Electricity	46,723	1,072	2,827	46,919	2.5	332,739
Natural Gas	80,932	305	3,051	81,011	4.3	1,383,721
Subtotal General Light Industri	127,655	1,377	5,878	127,930	6.8	1,716,460
Subtotal Industrial	127,655	1,377	5,878	127,930	6.8	1,716,460

Community Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Transportation						
Fullerton, California						
Heavy Duty Vehicles						
Diesel	85,010	505	536	85,094	4.5	1,054,275
Subtotal Heavy Duty Vehicles	85,010	505	536	85,094	4.5	1,054,275
Light Trucks						
Gasoline	596,894	81,961	59,536	610,223	32.3	7,639,571
Subtotal Light Trucks	596,894	81,961	59,536	610,223	32.3	7,639,571
Passenger Cars						
Gasoline	543,023	70,062	66,249	554,578	29.4	6,950,087
Subtotal Passenger Cars	543,023	70,062	66,249	554,578	29.4	6,950,087
Subtotal Transportation	1,224,927	152,528	126,321	1,249,895	66.2	15,643,934
Waste						
Fullerton, California						
Commercial						*Disposal Method - Managed Landfill*
Paper Products	0	0	2,471,628	25,952	1.4	
Food Waste	0	0	585,270	6,145	0.3	
Plant Debris	0	0	331,653	3,482	0.2	
Subtotal Commercial	0	0	3,388,550	35,580	1.9	
Subtotal Waste	0	0	3,388,550	35,580	1.9	
Total	1,824,560	160,192	3,579,638	1,886,976	100.0	23,086,157

Government Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Buildings and Facilities							
Fullerton, California							
Municipal Buildings							
Electricity	6,707	154	406	6,735	13.4	47,765	0
Natural Gas	469	2	88	470	0.9	8,013	0
Subtotal Municipal Buildings	7,176	156	494	7,205	14.4	55,778	0
Subtotal Buildings and Facilities	7,176	156	494	7,205	14.4	55,778	0
Streetlights & Traffic Signals							
Fullerton, California							
Streetlights and Traffic Signals							
Electricity	10,402	239	629	10,446	20.8	74,082	0
Subtotal Streetlights and Traffi	10,402	239	629	10,446	20.8	74,082	0
Subtotal Streetlights & Traffic Si	10,402	239	629	10,446	20.8	74,082	0
Airport Facilities							
Fullerton, California							
Fullerton Airport							
Electricity	1,385	32	84	1,391	2.8	9,863	0
Natural Gas	994	4	187	996	2.0	16,993	0
Subtotal Fullerton Airport	2,379	36	271	2,387	4.8	26,856	0
Subtotal Airport Facilities	2,379	36	271	2,387	4.8	26,856	0
Water Delivery Facilities							
Fullerton, California							
Imported Water							
Electricity	19,402	445	1,174	19,483	38.8	138,173	0
Subtotal Imported Water	19,402	445	1,174	19,483	38.8	138,173	0

Government Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Local Well Pumping							
Electricity	2,417	55	146	2,427	4.8	17,214	0
Subtotal Local Well Pumping	2,417	55	146	2,427	4.8	17,214	0
Subtotal Water Delivery Facilities	21,819	501	1,320	21,911	43.7	155,387	0
Wastewater Facilities							
Fullerton, California							
Untitled							
Electricity	3,981	91	241	3,998	8.0	28,352	0
Subtotal Untitled	3,981	91	241	3,998	8.0	28,352	0
Subtotal Wastewater Facilities	3,981	91	241	3,998	8.0	28,352	0
Vehicle Fleet							
Fullerton, California							
Municipal Vehicle Fleet							
Diesel	222	1	1	222	0.4	2,756	0
Gasoline	1,190	154	145	1,215	2.4	15,232	0
Subtotal Municipal Vehicle Flee	1,412	155	147	1,438	2.9	17,988	0
Subtotal Vehicle Fleet	1,412	155	147	1,438	2.9	17,988	0
Employee Commute							
Fullerton, California							
Employee Commute							
Gasoline	2,738	353	334	2,796	5.6	35,039	0
Subtotal Employee Commute	2,738	353	334	2,796	5.6	35,039	0
Subtotal Employee Commute	2,738	353	334	2,796	5.6	35,039	0
Total	49,908	1,530	3,437	50,181	100.0	393,482	0

ICLEI Clean Air Climate Protection (CACP) Software (Version 2.2.1b) Input Summary

City of Fullerton

Year 2030

COMMUNITY

	Electricity (kWh)	Natural Gas (thousand cu ft)
Residential		
Commercial Residential	3,415,286	29,220
Multi-Family	163,483,584	1,398,698
Single Family	148,916,584	2,116,831
Commercial		
College/University	68,152,241	333,459
Commercial Retail	166,182,787	635,438
Elementary School	2,807,087	13,735
High School	2,807,087	13,735
Office	108,837,578	205,582
Other	6,097,547	29,938
Industrial		
General Light Industrial	109,185,305	1,506,004

Waste	Tons
Commercial	201,726
Paper	34.9%
Food Waste	14.6%
Plant Debris	14.6%
Wood or Textiles	0.0%
Other	35.9%
Residential	50,097
Paper	27.5%
Food Waste	22.5%
Plant Debris	22.5%
Wood or Textiles	0.0%
Other	27.5%

Transportation	
Total VMT	2,181,466,604
Heavy Duty Vehicles (diesel):	52,355,198
Light Trucks (gasoline):	942,393,573
Passenger Cars (gasoline):	1,186,717,833

MUNICIPAL

Energy Usage	Electricity		Natural Gas	
Municipal Buildings	15,394,720	kWh	88,144	therms (data from city)
Streetlights and Traffic Signals	23,876,493	MWh	N/A	
Airport	3,178,907	kWh	18,165	thousand cu ft
Water Delivery Facilities (import)	47,375,536	kWh	N/A	
Water Well Pumps (local)	5,902,196	kWh	N/A	

Municipal Vehicle Fleet	Vehicle Miles
Heavy Duty Vehicles (diesel)	137,153
Passenger Cars (gasoline)	2,605,883
Employee Commute	
Passenger Cars (gasoline)	5,994,560

Community Greenhouse Gas Emissions in 2030
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Residential						
Fullerton, California						
Commercial Residential						
Electricity	1,637	38	99	1,644	0.1	11,656
Natural Gas	1,759	7	331	1,763	0.1	30,067
Subtotal Commercial Residenti	3,395	44	430	3,407	0.2	41,724
Multi-Family						
Electricity	78,349	1,798	4,741	78,677	3.7	557,964
Natural Gas	84,180	317	15,865	84,396	4.0	1,439,260
Subtotal Multi-Family	162,529	2,116	20,606	163,073	7.7	1,997,225
Single Family						
Electricity	71,368	1,638	4,319	71,667	3.4	508,248
Natural Gas	127,401	480	24,011	127,728	6.0	2,178,219
Subtotal Single Family	198,769	2,118	28,329	199,394	9.4	2,686,467
Subtotal Residential	364,693	4,278	49,366	365,874	17.2	4,725,415
Commercial						
Fullerton, California						
College/University						
Electricity	32,662	750	1,976	32,799	1.5	232,602
Natural Gas	20,069	76	3,782	20,121	0.9	343,129
Subtotal College/University	52,731	825	5,759	52,919	2.5	575,731
Commercial Retail						
Electricity	79,642	1,828	4,819	79,976	3.8	567,177
Natural Gas	38,244	144	7,208	38,342	1.8	653,866
Subtotal Commercial Retail	117,886	1,972	12,027	118,318	5.6	1,221,042

Community Greenhouse Gas Emissions in 2030
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Elementary School						
Electricity	1,345	31	81	1,351	0.1	9,581
Natural Gas	827	3	156	829	0.0	14,133
Subtotal Elementary School	2,172	34	237	2,180	0.1	23,714
High School						
Electricity	1,345	31	81	1,351	0.1	9,581
Natural Gas	827	3	156	829	0.0	14,133
Subtotal High School	2,172	34	237	2,180	0.1	23,714
Office						
Electricity	52,160	1,197	3,156	52,379	2.5	371,459
Natural Gas	12,373	47	2,332	12,405	0.6	211,544
Subtotal Office	64,533	1,244	5,488	64,783	3.0	583,003
Other						
Electricity	2,922	67	177	2,934	0.1	20,811
Natural Gas	1,802	7	340	1,806	0.1	30,806
Subtotal Other	4,724	74	516	4,741	0.2	51,617
Subtotal Commercial	244,217	4,183	24,265	245,121	11.5	2,478,821
Industrial						
Fullerton, California						
General Light Industrial						
Electricity	52,327	1,201	3,166	52,546	2.5	372,646
Natural Gas	90,639	342	3,416	90,727	4.3	1,549,678
Subtotal General Light Industri	142,965	1,543	6,583	143,273	6.7	1,922,324
Subtotal Industrial	142,965	1,543	6,583	143,273	6.7	1,922,324

Community Greenhouse Gas Emissions in 2030
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	
Transportation							
Fullerton, California							
Heavy Duty Vehicles							
Diesel	93,329	554	589	93,421	4.4	1,157,443	
Subtotal Heavy Duty Vehicles	93,329	554	589	93,421	4.4	1,157,443	
Light Trucks							
Gasoline	648,091	89,982	65,362	662,725	31.1	8,294,845	
Subtotal Light Trucks	648,091	89,982	65,362	662,725	31.1	8,294,845	
Passenger Cars							
Gasoline	541,392	76,918	72,732	554,078	26.0	6,929,215	
Subtotal Passenger Cars	541,392	76,918	72,732	554,078	26.0	6,929,215	
Subtotal Transportation	1,282,813	167,454	138,683	1,310,224	61.5	16,381,503	
Waste							
Fullerton, California							
Commercial							*Disposal Method - Managed Landfill*
Paper Products	0	0	3,584,257	37,635	1.8		
Food Waste	0	0	848,735	8,912	0.4		
Plant Debris	0	0	480,950	5,050	0.2		
Subtotal Commercial	0	0	4,913,941	51,596	2.4		
Residential							*Disposal Method - Managed Landfill*
Paper Products	0	0	701,385	7,365	0.3		
Food Waste	0	0	324,826	3,411	0.2		
Plant Debris	0	0	184,068	1,933	0.1		
Subtotal Residential	0	0	1,210,279	12,708	0.6		
Subtotal Waste	0	0	6,124,220	64,304	3.0		
Total	2,034,688	177,458	6,343,117	2,128,797	100.0	25,508,063	

Government Greenhouse Gas Emissions in 2030
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Buildings and Facilities							
Fullerton, California							
Municipal Buildings							
Electricity	7,378	169	446	7,409	13.0	52,542	0
Natural Gas	516	2	97	517	0.9	8,814	0
Subtotal Municipal Buildings	7,893	171	544	7,926	13.9	61,356	0
Subtotal Buildings and Facilities	7,893	171	544	7,926	13.9	61,356	0
Streetlights & Traffic Signals							
Fullerton, California							
Streetlights and Traffic Signals							
Electricity	11,443	263	692	11,491	20.2	81,490	0
Subtotal Streetlights and Traffi	11,443	263	692	11,491	20.2	81,490	0
Subtotal Streetlights & Traffic Si	11,443	263	692	11,491	20.2	81,490	0
Airport Facilities							
Fullerton, California							
Airport							
Electricity	1,523	35	92	1,530	2.7	10,850	0
Natural Gas	1,093	4	206	1,096	1.9	18,692	0
Subtotal Airport	2,617	39	298	2,626	4.6	29,541	0
Subtotal Airport Facilities	2,617	39	298	2,626	4.6	29,541	0
Water Delivery Facilities							
Fullerton, California							
Import							
Electricity	22,704	521	1,374	22,800	40.1	161,691	0
Subtotal Import	22,704	521	1,374	22,800	40.1	161,691	0

Government Greenhouse Gas Emissions in 2030
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Local							
Electricity	2,829	65	171	2,840	5.0	20,144	0
Subtotal Local	2,829	65	171	2,840	5.0	20,144	0
Subtotal Water Delivery Facilities	25,533	586	1,545	25,640	45.1	181,835	0
Wastewater Facilities							
Fullerton, California							
Wastewater							
Electricity	4,934	113	299	4,954	8.7	35,135	0
Subtotal Wastewater	4,934	113	299	4,954	8.7	35,135	0
Subtotal Wastewater Facilities	4,934	113	299	4,954	8.7	35,135	0
Vehicle Fleet							
Fullerton, California							
Municipal Vehcile Fleet							
Diesel	244	1	2	245	0.4	3,032	0
Gasoline	1,189	169	160	1,217	2.1	15,216	0
Subtotal Municipal Vehcile Flee	1,433	170	161	1,461	2.6	18,248	0
Subtotal Vehicle Fleet	1,433	170	161	1,461	2.6	18,248	0
Employee Commute							
Fullerton, California							
Employee Commute							
Gasoline	2,735	389	367	2,799	4.9	35,002	0
Subtotal Employee Commute	2,735	389	367	2,799	4.9	35,002	0
Subtotal Employee Commute	2,735	389	367	2,799	4.9	35,002	0
Total	56,588	1,731	3,907	56,897	100.0	442,607	0

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Statewide totals - 2020 (Statewide totals Avg Annual CYr 2020 Default Title)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	15,695,341	526,108,290	226,090.60	46,933.13	179,157.47	10.00%	17,915.75	161,241.72	50.76
LDT1	3,480,904	121,578,730	64,165.48	12,193.60	51,971.88	10.00%	5,197.19	46,774.69	14.72
LDT2	6,644,752	234,684,130	127,749.70	17,230.72	110,518.98	10.00%	11,051.90	99,467.09	31.31
MDV	2,953,681	105,720,040	78,133.72	10,197.36	67,936.36	10.00%	6,793.64	61,142.73	19.25
Total	**28,774,678**	**988,091,190**	**496,139.50**	**86,554.80**	**409,584.70**	**10.00%**	**40,958.47**	**368,626.23**	**116.04**

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Statewide totals - 2030 (Statewide totals Avg Annual CYr 2030 Default Title)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	17,590,598	586,996,610	251,843.00	77,615.70	174,227.30	10.00%	17,422.73	156,804.57	49.36
LDT1	4,061,650	143,081,330	75,850.65	22,162.58	53,688.07	10.00%	5,368.81	48,319.27	15.21
LDT2	7,673,554	269,595,360	148,148.10	31,235.67	116,912.43	10.00%	11,691.24	105,221.19	33.12
MDV	3,442,362	122,072,280	90,985.91	18,875.21	72,110.70	10.00%	7,211.07	64,899.63	20.43
Total	**32,768,164**	**1,121,745,580**	**566,827.66**	**149,889.16**	**416,938.50**	**10.00%**	**41,693.85**	**375,244.65**	**118.12**

Electricity Emissions Emissions Reductions from State Legislation

Sector	City-Wide Electricity Emissions (MTCO2eq) (Business as Usual)			Emissions with SB 1078 and SB 107		
				16% Renewable	33% Renewable	33% Renewable
	2009	2020	2030	2009	2020	2030
Residential	112,866	125,969	137,881	112,866	104,555	114,441
Commercial	101,169	129,334	154,938	101,169	107,347	128,599
Industrial	42,564	45,238	47,669	42,564	37,548	39,565
Municipal	40,352	43,461	46,288	40,352	36,073	38,419
Total	*296,951*	*300,541*	*340,488*	*296,951*	*285,522*	*321,024*

Community Emissions

	2009		2020		2030	
	$MTCO_2eq$	percent	$MTCO_2eq$	percent	$MTCO_2eq$	percent
Residential	278,485	16.3%	306,472	16.8%	331,915	17.2%
Commercial/Institutional	151,131	8.8%	188,447	10.3%	222,370	11.5%
Industrial	116,056	6.8%	123,347	6.8%	129,975	6.7%
Transportation	1,133,886	66.2%	1,162,553	63.6%	1,188,615	61.5%
Waste	32,278	1.9%	45,927	2.5%	58,336	3.0%
Total	*1,711,836*	*100%*	*1,826,746*	*100%*	*1,931,211*	*100%*

Municipal Emissions

	2009		2020		2030	
	$MTCO_2eq$	percent	$MTCO_2eq$	percent	$MTCO_2eq$	percent
Buildings and Facilities	6,536	14.4%	6,879	14.1%	7,190	13.9%
Streetlights and Traffic Signals	9,476	20.8%	9,973	20.5%	10,424	20.2%
Airport	2,165	4.8%	2,279	4.7%	2,382	4.6%
Water Delivery Facilities	19,877	43.7%	21,649	44.4%	23,260	45.1%
Wastewater Facilities	3,627	8.0%	4,081	8.4%	4,494	8.7%
Employee Commute	2,536	5.6%	1,902	3.9%	1,325	2.6%
Vehicle Fleet	1,305	2.9%	1,951	4.0%	2,539	4.9%
Total	*45,522*	100%	*48,714*	100%	*51,614*	100%

Community + Municipal Total	1,757,358	1,875,460	1,982,825
15%	*263,604*	*281,319*	*297,424*

Goal/Policy			Estimated Annual Reduction ($MTCO_2eq$) 2020	2030
STATE AND FEDERAL REDUCTIONS				
AB 1493 and EO S-1-07			291,114	392,680
25% reduction by 2020				
33% reduction by 2030				
SB 1079 and 107			48,160	54,149
33% RPS By 2020				
Subtotal			*339,274*	*446,829*
TRANSPORTATION AND MOBILITY STRATEGY				
T-1	Reduction of Single Occupant Vehicle Trips		110,623	117,465
Travel/Commute Survey, implement a Voluntary Trip Reduction Program				
California Air Pollution Officers Control Association, *Quantifying Greenhouse Gas Mitigation Measures* , August 2010.				
Measure 3.4.1 - Voluntary Commute Trip Reduction Program				
Increase transit network coverage by 10% by 2020.		40,756		
California Air Pollution Officers Control Association, *Quantifying Greenhouse Gas Mitigation Measures* , August 2010.				
Measure 3.5.3 - Expand Transit Network				
Transit oriented/infill development, redesigned sites, 6% reduction.		69,867		
Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007.				
http://www.ccap.org/safe/guidebook.php				
Victoria Transport Policy Institute, Online TDM Encyclopedia,Land Use Impact on Transport, November 2010.				
http://www.vtpi.org/tdm/tdm20.htm				
T-2	Inter-Jurisdiction Connection		6,987	11,899
Implement 60% of the connections by 2020				
100% of connections by 2030				
Center for Clean Air Policy, *CCAP Transportation Emissions Guidebook* , 2007.				
http://www.ccap.org/safe/guidebook.php				
T-3	Bicycle Transportation Plan		29,111	35,698
Implement the 19 short-term projects by 2016.				
Implement the 20 medium-term projects by 2020.				
Implement the 18 long-term projects by 2030.				
California Air Pollution Officers Control Association, *Quantifying Greenhouse Gas Mitigation Measures* , August 2010.				
Measure 3.2.1 - Pedestrian Network Improvements				
Measure 3.2.5 - Incorporate Bike Lanes				

T-4	Bicycle Use on All Streets	Supporting Measure	
Complete the short-term bicycle infrastructure improvements by 2016.			
T-5	Bicycle Safety and Convenience	Supporting Measure	
Complete a bicycle sharing program by 2020.			
T-6	Circulation Between Cities	23,289	23,799
Establish a BRT line by 2020.			
Provide feedback to OCTA on their Transit System Study.			
California Air Pollution Officers Control Association, *Quantifying Greenhouse Gas Mitigation Measures* , August 2010.			
Measure 3.5.1 - Provide a Bus Rapid Transit System			
T-7	Support Infrastructure for Low and Zero Emission Vehicles	3,297	4,987
Establish 4 alternative fuel stations by 2020 and 6 stations by 2030.		2,906	4,457
20 percent alternative fuel vehicles in the City's fleet by 2020.		390	
40 percent alternative fuel vehicles in the City's fleet by 2030.			530
U.S. Department of Energy, Energy Efficiency and Renewable Energy, Alternative Fuels and Advanced Vehicles Data Center			
http://www.afdc.energy.gov/afdc/vehicles/natural_gas_emissions.html			
T-8	Rail and Rapid Transit	1,744	1,783
Expand parking facilities at the Fullerton Metro station by 2015.			
California Air Pollution Officers Control Association, *Quantifying Greenhouse Gas Mitigation Measures* , August 2010.			
Measure 3.5.2 - Implement Transit Access Improvements			
Measure 3.5.3 - Expand Transit Network			
T-9	Car Sharing Pilot Program	6,975	7,132
Complete the car sharing study by 2015.			
Implement the car sharing program by 2020.			
California Air Pollution Officers Control Association, *Quantifying Greenhouse Gas Mitigation Measures* , August 2010.			
Measure 3.4.9 - Implement Car-Sharing Program			
	Subtotal	*182,026*	*202,763*
Energy Use and Conservation			
E-1	GHG Emissions from Electrical Generation	69,555	102,639
Achieves a 15 percent improvement in efficiency.			
E-2	Energy- and Resource-Efficient Design	23,185	
Adopt the energy conservation ordinance by 2016.			
E-3	Energy Efficient Retrofits	Supporting Measure	
Update website by 2014.			
Develop outreach programs by 2015.			
E-4	Efficient Use of Energy Resources in Residential Development	Supporting Measure	
Adopt Energy Conservation Ordinance by 2016.			
E-5	Sustainable Regional Revitalization Efforts	Supporting Measure	
Ongoing			
	Subtotal	*92,740*	*102,639*

Water Use and Efficiency			
W-1	Conservation Efforts	Supporting Measure	
Adopt the water conservation strategy by 2015.			
W-2	Sustainable Water Practices in New Development	3,860	5,551
Reduce water consumption 15 percent by 2020. Reduce water consumption 20 percent by 2030.			
W-3	GHG Emissions from Water Conveyance	433	465
Expand infrastructure to supply at least 20 percent of the City's outdoor water demand by 2020.			
	Subtotal	*4,292*	*6,016*
SOLID WASTE REDUCTION AND RECYCLING			
SW-1	Regional Waste Management	Supporting Measure	
Education, informational, and outreach programs			
SW-2	Waste Reduction and Diversion	6,889	14,584
increase waste stream diversion rate by 10% in 2020 and by 25% in 2030			
SW-3	Waste Stream Separation and Recycling	Supporting Measure	
SW-4	Food-Waste Processing Facility	3,068	9,742
Divert 40 percent of organics from commercial waste stream by 2020. Divert 100 percent of organics from residential waste stream by 2030.			
SW-5	GHG Emissions from Waste	Supporting Measure	
Work with MG Disposal to upgrade their collection truck fleet.			
	Subtotal	*9,957*	*24,326*